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UNIVERSITY OF ALBERTA

PRE AND POST DISCHARGE INDEPENDENCE IN ACTIVITIES OF DAILY LIVING OF ADULTS WITH HIP FRACTURES

BY

MARY REILLY

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

DEPARTMENT OF OCCUPATIONAL THERAPY

EDMONTON, ALBERTA

SPRING 1991

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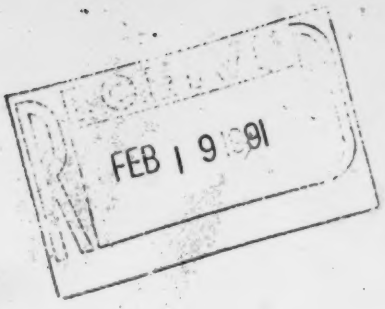

APPENDIX IV

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Editor
Maryland Medical Journal
1211 Cathedral St
Baltimore, Maryland
21201
USA

Dear Sir or Madam,

I am a graduate student in occupational therapy at the University of Alberta. In my thesis research project I measured ADL performance in hip fractured individuals using the Barthel Index. This measurement tool was published in your journal in 1965 in the article: Mahoney, F.I., & Barthel, D.W. (1965). Functional evaluation: The Barthel Index. Maryland State Medical Journal, 14, 62-65.

I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to reprint the Barthel Index for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to reprint the Barthel Index and include it in her master's thesis in Occupational Therapy at the University of Alberta.

[signature] 2/19/90

Editor — Date
Maryland Medical Journal
(formerly Maryland State Medical Journal)

Managing Editor

APPENDIX VI

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Frances Oakley
Co-ordinator, Clinical Research
Occupational Therapy Service
National Institute of Health
Bethesda, Maryland
20892
USA

Dear Ms Oakley,

I wrote to you in July 1989 stating my intention to use the Role Checklist in my master's thesis research project. I requested a copy of this assessment from you and you sent it to me. I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the Role Checklist for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy the Role Checklist and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Frances Oakley
Francis Oakley, M.S.

February 25, 1991
Date

APPENDIX VIII

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Dr Jerome Yesavage
Associate Professor
Stanford University Medical School
Stanford University
Stanford, CA
94305
USA

Dear Dr Yesavage,

I am a graduate student in occupational therapy at the University of Alberta. In my thesis research project I compared pre and post discharge ADL performance of hip fractured individuals. I measured depression using your Geriatric Depression Scale.

I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the Geriatric Depression Scale for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy the Geriatric Depression Scale and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Jerome Yesavage, M.D.

2/15/91
Date

APPENDIX X

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Dr Eric Pfeiffer
University of Southern Florida
12901 N 30th St
Tampa, Florida
33612
USA

Dear Dr Pfeiffer,

I am a graduate student in occupational therapy at the University of Alberta. In my thesis research project I compared pre and post discharge ADL performance of hip fractured individuals. I measured mental status using your Short Portable Mental Status Questionnaire.

I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the Short Portable Mental Status Questionnaire for this purpose. Thank you.

Sincerely,

Mary Reilly

I give my permission to Mary Reilly to copy the Short Portable Mental Status Questionnaire and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Eric Pfeiffer, M.D. — Date 2/20/91

APPENDIX XIII

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Dr Patricia Brandt
Associate Professor
Parent-Child Nursing, SC-74
University of Washington,
Seattle, Washington
98195
USA

Dear Dr Brandt,

I wrote to you in July 1989 stating my intention to use Part 2 of the Personal Resource Questionnaire (PRQ) in my master's thesis research project, after I received a copy of this assessment from you. I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the PRQ for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy Part 2 of the Personal Resource Questionnaire and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Patricia A. Brandt — 2/19/91

Patricia Brandt, PhD — Date

APPENDIX XIV

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Clarann Weinert, S.C.
School of Nursing
Montana State University
Bozeman, Montana
59717
USA

Dear Sr Weinert,

I wrote to Dr Brandt in July 1989 stating my intention to use Part 2 of the Personal Resource Questionnaire (PRQ) in my master's thesis research project, after I received a copy of this assessment from her. I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the PRQ for this purpose. Thank you.

Sincerely,

Mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy Part 2 of the Personal Resource Questionnaire and include it in her master's thesis in Occupational Therapy at the University of Alberta.

J. Clarann Weinert — 2/19/91

Clarann Weinert, S.C. — Date

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: MARY REILLY

TITLE OF THESIS: PRE AND POST DISCHARGE INDEPENDENCE IN ACTIVITIES OF DAILY LIVING OF ADULTS WITH HIP FRACTURES

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Mary Reilly

#410, 540 Cambridge St S.
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K1S 5M7

April 11, 1991

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

THE UNDERSIGNED CERTIFY THAT THEY HAVE READ, AND RECOMMEND TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH FOR ACCEPTANCE, A THESIS

ENTITLED: PRE AND POST DISCHARGE INDEPENDENCE IN ACTIVITIES OF DAILY LIVING OF ADULTS WITH HIP FRACTURES

SUBMITTED BY MARY REILLY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (OCCUPATIONAL THERAPY)

Sharon Warren

Dr Sharon A. Warren

Gail B. Gilewich

Prof. Gail Gilewich

Dr Patrick A. Hessel

Date: April 11, 1991

Abstract

Hip fractures are a common and serious problem among the elderly. Discharge planning for an individual who has fractured a hip is often carried out using information from a predischarge activities of daily living (ADL) evaluation. However, little information is available regarding how the results of such an assessment compare with the patient's independence at home following discharge.

Sixty-one individuals who had fractured hips and were being treated on an orthopaedic or geriatric rehabilitation unit received an ADL assessment during the 3 days prior to discharge. Information was also collected regarding the following potential predictors of less independent performance at home: role loss, depression, mental status, health status and social support. Independence in ADL at home was measured 3 weeks following discharge using a telephone interview.

The concordance between predischarge and post discharge independence in ADL was statistically significant but quantitatively low ($K_W = .221$; $p < .05$). While 21.3% of the subjects demonstrated the same level of independence pre and post discharge, 50.8% demonstrated less independent function post discharge. Neither role loss, depression, mental status, health status or social support identified those patients who

were less independent post discharge. Limitations of this study include a small sample size and possible reporting error.

The results of this study indicate that an ADL evaluation alone may not be a precise indicator of how independent individuals who have fractured hips will be at home following discharge from hospital. It is recommended, therefore, that community follow-up be carried out with these individuals.

Acknowledgement

I wish to express my appreciation to my supervisor, Dr Sharon Warren, and to the other members of this thesis committee, Professor Gail Gilewich, and Dr Pat Hessel, for their help and guidance. I would also like to thank Dr Laura Krefting who offered supervision in the early stages of this project.

Many thanks to my husband, John Reilly, and my friend, Gisele Gaudet, for their tireless support.

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Introduction

Hip fractures are a common and serious injury among older adults (Hielema, 1979). The occupational therapist plays an important role in the rehabilitation of the individual who has fractured a hip. The therapist's aim is to maximize the individual's independence in activities of daily living (ADL) through education, training and recommendation of adapted equipment (Kumar and Redford, 1984). The therapist also assists in discharge planning by assessing the individual's current level of ADL independence (Reed, 1984).

The individual's post discharge ADL independence plays an important role in determining placement (Jette, Harris, Cleary and Campion, 1987), strain on caregivers (Sanford, 1975) and requirements for home health services (Hawe, Gebski and Andrews, 1986). However, discharge planning recommendations are often made on the basis of a predischarge ADL assessment (Hopson, 1981), not a post discharge ADL assessment. The accuracy with which these assessments predict independence at home following the individual's discharge from hospital is not known. The first aim of this study, therefore, was to determine the concordance between predischarge ADL assessments and post discharge ADL independence.

Less independent performance in ADL at home as

compared with abilities demonstrated during in-hospital ADL assessments has been documented in a significant number of individuals with other medical conditions (Andrews and Stewart, 1979; Arenth and Mamon, 1985; Haworth and Hollings, 1979; Strub and Levine, 1987). This phenomenon may also occur in individuals who have fractured hips. In these cases, a predischarge ADL assessment alone would give the occupational therapist a poor indication of actual post discharge needs. The second aim of this study was to determine the proportion of individuals who have fractured hips who do not perform as independently in ADL at home as they did during predischarge ADL assessments.

Patient characteristics that may be related to such an outcome and could be identified prior to the patient's discharge, could be used by occupational therapists to determine which patients are likely to perform less independently at home. The third aim of this study was to determine whether role loss, depression, mental status, health status or social support are associated with less independent post discharge ADL performance.

Objectives

The objectives of this study were:

1. To determine the concordance between predischarge ADL assessments and post discharge ADL independence in

individuals with hip fractures.

2. To determine the proportion of individuals who have fractured hips who perform less independently at home post discharge than they did during predischarge ADL assessments.

3. To examine the relationship between less independent ADL performance and:

i) role loss

ii) depression

iii) mental status

iv) health status

v) social support

Definitions

Activities of daily living

Activities of daily living (ADL) are "the endeavors that we accomplish on a daily basis in order to maintain personal independence" (Erikson and McPhee, 1988; p. 25). While these authors include in their description of ADL eating, bathing, grooming, toileting, ambulation and communication, finer distinctions have been made. Lawton and Brody (1969) suggest that ADL be separated into two categories, physical self-maintenance and instrumental self-maintenance skills. Physical self-maintenance ADL include the basic skills of dressing, feeding, personal hygiene, toileting, transfers and ambulation. Instrumental self-maintenance skills encompass

the principal activities required for independent community living including using the telephone, shopping, preparing food, housekeeping, doing laundry, using public or private transportation and managing finances and medication. It should be noted that physical self-maintenance ADL have also been referred to as self-care skills (Christiansen, Schwartz and Barnes, 1988). For the purposes of this study the terms ADL, physical self-maintenance skills and self-care skills will be used synonymously.

Role

A role is an internalized image that an individual has of him or herself. This image pertains to the place which the individual believes he or she holds within his or her social group. A role entails specific responsibilities and privileges and serves to organize and maintain patterns of behavior (Kielhofner and Burke, 1985).

Depression

Despite widespread use of this term in scientific and popular literature, an exact definition for the term depression remains elusive (Levitt, Lubin and Brooks, 1983). In defining the concept in psychiatric terms Klerman (1983) states "depression covers a wide range of changes in affective states ranging in severity from mood fluctuations in everyday life, sometimes called sadness or despondency, to severe

melancholic psychotic episodes related to the psychodynamic mechanisms of loss and repression" (p. 4). He presents the following list of common symptoms: depressed mood, loss of appetite, insomnia and decreased activity.

Clinical criteria for the diagnosis of depression are set out in the Diagnostic Statistical Manual (DSM III-R) produced by the American Psychiatric Association (1987). Two mental disorders are associated with depressed affect. These are major depressive episodes and dysthymia. A major depressive episode is characterized by "depressed mood... or loss of interest or pleasure in all, or almost all, activities...for a period of at least two weeks" (American Psychiatric Association, 1987; p. 218). The accompanying symptoms include a change in appetite and/or weight, sleep disturbances, decreased energy, feelings of worthlessness, decreased concentration and suicidal thoughts or acts. Dysthmia is a similar but less intense and more chronic disorder.

A clinical diagnosis of depression is generally made using the DSM III-R or other standard diagnostic criteria in conjunction with impressions from a clinical interview and examination (American Psychiatric Association, 1987). In this study, the term depression will be used to describe a mental disorder of the intensity that it could be clinically diagnosed as a depressive illness by a physician.

Mental status

Mental status is an aggregation of cognitive skills and affective states which are systematically examined to obtain a global picture of an individual's current level of mental health (Strub and Black, 1985). Areas examined include general appearance, attitude, motor behavior, speech, mood, thought processes and content, perception, intellectual functioning, orientation, memory and judgement (Nicholi, 1988).

The term mental status can also be used to refer to specific aspects of intellectual functioning including orientation, memory, serial calculation and general information (Pfeiffer, 1975). Brief testing of these skills can provide "a gross estimate of the patient's global cognitive functioning" (Strub and Black, 1985, p. 159). In this study, the term mental status will be defined in this latter way.

Health status

Health status refers to an individual's overall sense of physical, mental and emotional well-being. Many areas must be examined in order to obtain such a comprehensive picture of an individual's wellness in all of these areas. However, one subjective indicator of overall health can be obtained by asking the individual how he or she feels in general (McDowell and Newell, 1987). It is in this sense, how well the individual feels, that the term health status will be used.

Social support

Social support is another term for which researchers lack a consistent definition (Norbeck, Lindsey and Carrieri, 1981). Kahn (1981) views social support as "interpersonal transactions that include one or more of the following: the expression of positive affect of one person towards another; the affirmation or endorsement of another person's behavior, perceptions or expressed views; the giving of symbolic or material aid to another" (p. 85). Orth-Gomer and Unden (1987) see social support as emotional, physical and financial assistance provided to another individual. Weiss (cited in Brandt and Weinert, 1980) believes that social support is a transactional process and includes what the individual can give to others as well as what he or she receives from them. He maintains that social support has five components: i) the feeling that one is a valued member of the social group; ii) perception that one is a necessary member of the group; iii) opportunities for intimacy; iv) opportunities to be nurturing and; v) the provision by others of informational, practical and emotional support. In this study, Weiss's definition of social support will be used.

Relevance

Hip fractures are a common and possibly increasing health problem among the elderly (Finsen, 1988). Occupational therapists who work with hospitalized individuals who have

fractured hips assist these individuals to optimize their independence in ADL. These therapists also make recommendations regarding the level of care required by these individuals following discharge (Reed, 1984). Discharge recommendations are often made on the basis of the patient's independence in ADL (Trombly, 1989). It is important, therefore, that occupational therapists are aware of the concordance between performance on a predischarge ADL assessment and ADL independence post discharge.

It is not yet known what proportion of individuals who have fractured hips do not perform as independently at home post discharge as they did during predischarge ADL assessments. A large number of patients may return home dependent in activities which they performed independently during ADL assessments. If this is so, significant occupational therapy protocol changes may be required to ensure that these individuals remain as independent at home as they were in hospital and/or ensure that appropriate post discharge supports have been recommended. For example, one such change may be the addition of a home visit follow-up to the treatment protocol.

Greater ADL dependence post discharge may be a problem for a small but identifiable segment of the hip fractured population. A method of determining which patients

will function less independently at home would be extremely helpful in discharge planning. For example, patients deemed at risk for less independent functioning at home could be assisted by community occupational therapy follow-up. Evidence that role loss is associated with decreased post discharge independence could help in the design of occupational therapy interventions for patients who are deemed to be at risk for such an outcome.

Literature review

Introduction

The relationship between ADL independence noted on predischarge assessment and ADL independence at home post discharge among older adults who have suffered a hip fracture was examined in this study. In preparation for this, literature from the following areas was reviewed and is presented here. First, occupational therapy theory relevant to ADL is scrutinized and the measurement of ADL discussed. Next, the scope of the problem of hip fracture among older adults is described, as is the treatment, course and outcome of this injury. Differences in predischarge ADL assessment and post discharge ADL performance in the hip fractured population and other patient groups is examined. Finally, the relationship between role function and less independent post discharge ADL performance and factors which may confound any relationship between these two variables are discussed.

ADL and occupational therapy practice

Assessment and retraining of ADL is seen as a priority for occupational therapists working in physical medicine including those working with individuals who have fractured a hip (Rausch and Melvin, 1986). Reed (1984) outlines a descriptive model of occupational therapy practice based on assessment of and intervention to promote ADL independence. Contained in

this model are a number of assumptions regarding ADL. Activities of daily living are a measure of an individual's functional abilities. These activities impact on the roles an individual can carry out and how he or she functions in these roles. Additionally, performance of ADL requires an integration of physical, cognitive, perceptual, psychological, social, economic and cultural factors. Reed goes on to outline the purpose of ADL evaluation. This includes the assessment of the individual's present level of independence in the institution and the home environment as well as the determination of the training, adaptations and assistance which will be required by the individual following discharge from the institution.

In one of the generic models of occupational therapy practice, the model of human occupation (Kielhofner and Burke, 1980), ADL is viewed as the occupational output of three internal subsystems which determine the individual's interpretation of external and internal information. According to this model, human beings are open systems which take in information from the environment (input), process this information (throughput) and produce activity (output). Output and its consequences provide the human with further information (feedback).

Information which reaches the individual from within and without is processed as throughput. This throughput is

processed within a hierarchy of three subsystems which ultimately determine the activity that the individual will perform. The highest of these subsystems, the volitional subsystem, initiates action. It is made up of the individual's values and interests and his or her sense of personal causation. The next level, the habituation subsystem, organizes and maintains activity through habits and roles. The lowest of the three subsystems is the performance subsystem. This level contains motor, perceptual and interpersonal skills which allow the individual to actually carry out the activities which the volitional subsystem has initiated and the habituation subsystem has organized. It should be noted that while the subsystems determine which activities the individual will produce, during throughput the subsystems themselves are altered by the input which they process.

The model states that the individual requires certain physical and mental skills in order to carry out any occupational behaviour including ADL. That is, certain components of the performance subsystem must be intact. However, performance of ADL will not be maintained if the habituation subsystem, that is the individual's roles and habits, have been disrupted. Therefore, the ability to carry out ADL may be present, but the activities would not be routinely carried out if a disruption occurred in the individual's roles and

habits. Furthermore, activity would not be initiated if there was a disruption in the individual's values, interests and sense of personal causation (Snow and Rogers, 1985).

From the above theoretic models, it can be assumed that while certain physical skills are required in order to carry out ADL, the continued performance of these skills is affected by psychological, social, economic and cultural factors. One may have the ability to carry out self-care activities, but these will not be regularly performed unless they are part of one's roles and habits and are consistent with values and interests.

Measuring ADL independence

Activities of daily living are, by definition, familiar and accessible to most people. Despite this familiarity, the measurement of ADL independence has been problematic. Numerous scales have been developed without regard to how they can be properly utilized (Law and Letts, 1989). Law and Letts (1989) recommend that ADL scales be categorized according to their ability to describe (i.e. provide a description of function at one point in time so that individuals can be compared), evaluate (i.e. provide a measure of function so that the performance of one individual can be compared over different points in time), or predict function (i.e. provide a score which can be used to predict function at a later point in time). They reviewed a number of scales and concluded that

the Barthel Index (Mahoney and Barthel, 1965) could be utilized for any of these three purposes.

Activities of daily living have long been important as both a theoretical and a practical concept for occupational therapists. Independence in ADL has frequently been included as a measure of outcome following hip fracture.

Hip fracture

The incidence of hip fracture in the United States has been estimated at 98 per 100,000 (Lewinnek, Kelsey, White and Kreiger, 1980). In Canada the diagnosis ranks fourth in hospital days accounted for by females and fourteenth in hospital days accounted for by males (Statistics Canada, 1989). The risk of hip fracture increases with age and there is evidence that, with improved life expectancy, incidence of hip fracture is increasing (Finsen, 1988).

Hip fractures in the elderly are usually one of two types. The first, subcapital or intracapsular fractures, occur proximal to the blood vessels which supply the head of the femur. Because of this disruption of the blood supply to the femoral head and subsequent necrosis of this part of the bone may take place following a displaced subcapital fracture. For this reason some surgeons choose to immediately replace the femoral head with an artificial head, such as the Austin Moore prosthesis. This allows almost immediate weight bearing following surgical

repair (Kane, Ooslander and Abrass, 1989).

If a subcapital fracture is minimally displaced or undisplaced, the surgeon may elect to internally fix the fracture with pins, compression screws or a plate. Duckworth (1984) states that due to surgical advances, these techniques provide repair without necrosis to the femoral head in up to 90% of all cases even when the fracture is displaced. For this reason, and the fact that a hip prosthesis may loosen following years of wear, some surgeons opt for pin and plate repair even when the patient has had a displaced subcapital fracture. Following such a repair, the patient is allowed to take partial weight through the affected leg.

The second type of hip fracture commonly seen in older adults is the intertrochanteric (also known as extracapsular or peritrochanteric) fracture. Because this fracture occurs below the level of the blood vessels which supply the femoral head, it is not likely to disrupt the blood supply and result in necrosis. This fracture is internally fixated using compression screws and a side plate or nails and a sliding plate. The sliding action of the plate ensures that when the bone is compressed during weight bearing the plate slides down the shaft of the femur and not into the acetabulum (Duckworth, 1984). Protected weight bearing is allowed following these repair procedures (Kane, Ooslander and Abrass, 1989).

Today the course of recovery following the two types of fracture and the various repair procedures is quite similar. Hospitalization following surgery lasts approximately 3 weeks. Crutch walking is sometimes recommended to ensure protected weight bearing for 6 weeks post surgery. However, a walker is usually preferred because it allows protected weight bearing without requiring undue energy expenditure on the part of the elderly patient. Patients progress from a walker to a cane approximately 6 to 9 weeks after surgery and go on to unassisted weight bearing as they are able (J. Hunter, orthopaedic surgeon, personal communication, October 30, 1989).

The results of studies of ADL independence following hip fracture have generally indicated no significant difference in outcome based upon the type of fracture, the method of fracture repair or the severity of the fracture. Baker, Duckworth and Wilkes (1978) found that the type of fracture was not predictive of ADL independence 6 months post fracture. Jette et al. (1987) found that in 75 individuals who had fractured hips, those with intertrochanteric fractures were less independent in ADL at 6 months post fracture than those with subcapital fractures. However, at 12 months there was no difference. In contrast to this finding, Greatorex and Gibbs (1988) found that among 226 consecutive hip fractured

patients, site of fracture was predictive of ADL independence at 6 months post fracture. Patients with subcapital fractures were less independent at follow-up.

Severity, as well as fracture site, has been examined as a predictor of ADL independence following hip fracture in two studies (Cobey et al., 1976 Cummings et al., 1988;). Severity of fracture was not predictive of ADL independence at 6 month follow-up in either study. In summary, studies to date suggest that ADL independence at 6 to 12 months post fracture is similar for individuals regardless of fracture site, type of repair or severity of fracture.

Recovery of ADL independence following hip fracture

The extent of expected functional recovery following hip fracture has been well established. Between one third and one quarter of individuals who have fractured hips do not regain their premorbid levels of ADL independence (Cobey et al., 1976; Jette et al., 1987). Post fracture dependence in ADL may lead to institutional placement (Jette et al., 1987), strain on family caregivers (Sanford, 1975) or referral to home health care agencies (Hawe, Gebski and Andrews, 1986).

Several studies have examined risk factors for post fracture decline in ADL independence. In one of the earliest of these studies 147 patients were contacted at 6 month intervals for up to 9 years post fracture (Katz et al., 1967). Increasing

age, presence of chronic disease and prefracture functional limitations were associated with failure to return to prefracture levels of independence. Thomas and Stevens (1974) in a study of 100 patients 12 months post surgical repair also noted an association between prefracture functional limitations and increasing age and failure to recover to premorbid levels of ADL independence. This study identified poor clinical result of the fracture repair as an additional risk factor. Unfortunately general health status was not examined or controlled for in either study.

Jensen (1979) followed 518 patients 6 months post fracture and found technical failure of the repair to be associated with poor ADL outcome. However, level of premorbid dependence on social welfare supports was found to be the best predictor of poorer post fracture ADL independence. Greater dependence in ADL was also associated with older age. Results of interviews with these patients led the authors to conclude that the "presence of a spouse or companion had been a powerful spur to physical recovery. Furthermore, the effect of that person often seemed to be increased if the patient was the dominant or 'needed' partner" (p. 457).

Later work confirms the importance of psychological and social factors in the recovery of ADL independence. Decreased

mental status has consistently been identified as a risk factor for poor functional outcome (Cummings et al., 1988; Miller, 1978; Mossey, Mutran, Knott and Craik, 1989). As well, previously independent older women who suffered hip fractures and had high post surgical depression scores were more likely to experience poor recovery (Mossey et al., 1989).

Individuals who live with another person have been found to be more likely to return home following hospitalization for hip fractures (Ceder et al., 1979; Ceder, Thorngren and Wallden, 1980). Patients with a greater number of social supports were more likely to return to their premorbid functional status (Cummings et al., 1988). Those who made regular trips outside their homes prior to the fracture were more likely to achieve their original functional status (Cobey et al., 1976) and return home (Ceder et al., 1980). It is difficult to determine, though, whether this was due to higher premorbid functional status, higher levels of social involvement, or some other factor.

The above studies have indicated factors which may help predict how an individual's ADL independence 6 to 12 months following hip fracture will compare to his or her abilities prior to the fracture. The occupational therapist, however, attempting to assist in discharge planning for the individual who has fractured a hip, may be more interested in how the

patient's post discharge ADL independence will compare with his or her performance on a predischarge ADL assessment. Relatively few studies have addressed this question in the hip fractured or other patient populations.

ADL independence: Home versus hospital

There is evidence that some hip fractured patients continue to make gains in ADL independence for up to 2 years following fracture (Katz et al., 1967). It appears, as well, that a number of individuals may become less independent in ADL following discharge from hospital. Katz and his colleagues (1967) report that only 72% of patients who had regained their prefracture level of ADL independence had sustained these gains at 18 months post fracture.

Discrepancies between ADL performance in hospital and at home have been noted in a number of other patient populations. Fifty-two per cent of stroke patients attending a day hospital program were found to be dependent at home in activities which they had performed independently in the occupational therapy program (Andrews and Stewart, 1979). Patients with divergent function were not more depressed than patients whose function was consistent; however, depression was rated using the therapist's subjective impression of the patient's mood. Discrepant function was found in association with passive patient attitudes and negative caregiver attitudes.

Again, the subjectivity with which these assessments were made call the results into question.

Strub and Levine (1987) examined the records of 17 hemiplegic patients who had been discharged from hospital and were being followed by a home health agency. These investigators found a decrease in independence in bathing and upper extremity dressing in a significant number of patients at the time of assessment by the referral agency. They hypothesized that the decrease in independence would correlate with the amount of time between hospital discharge and initiation of follow-up services. A significant association between the two was not found.

When a group of rheumatology patients were assessed for ADL independence prior to and 10 days following discharge from hospital, 21% were found to have deteriorated in their ability to independently bathe or shower. Decreased independence transferring in and out of cars was noted in 32% of these patients (Haworth and Hollings, 1979). The authors attributed this decline to three factors: greater fatigue at home due to more numerous activity demands; presence of role functions which required the individual to carry out certain tiring tasks and; loss of confidence.

When Arenth and Mamon (1985) compared nurses predischarge ADL evaluations of 56 oncology patients with

responses to questions regarding ADL independence made by the patients during a telephone interview 3 weeks following discharge, they found that nursing staff had rated many patients self-sufficient in a number of tasks which these patients felt unable to manage at home. The greatest number of over assessments took place in the area of stair climbing (nurses rated 33% of the patients more independent than they actually were at home). A large proportion of patients were also over assessed with regards to bathing (23%), transfers (17%), walking (8%) and dressing (7%). The authors concluded that these discrepancies were particularly alarming in light of the fact that staff based their discharge plans on predischarge assessments of ADL.

The preceding five studies compared predischarge ADL assessments with post discharge ADL independence. Every one of the studies found that a significant number of patients did not perform as independently following discharge as they had during predischarge assessments. Only one of the studies examined factors which may have been predictive of less independent post discharge function (Andrews and Stewart, 1979); the findings of this study were not conclusive. Clearly, less independent post discharge ADL performance is a common but as yet unpredictable occurrence. To examine whether or not a proportion of individuals who have fractured hips

experience the same phenomenon, measurement of ADL independence pre and post discharge should be carried out. Documentation of such a study in the literature could not be found. However, many studies have been carried out which have assessed ADL independence among individuals who have fractured a hip at intervals (particularly 6 and 12 months) following the fracture. The findings of these studies have been discussed previously. Measurement methods used in these studies will now be examined.

Measurement of ADL independence post discharge

Studies of functional recovery following hip fracture have measured ADL independence using a variety of techniques. Mossey et al. (1989) interviewed patients face-to-face at 2 and 6 months post surgery and then by telephone at 12 months. Jette et al. (1987) interviewed patients during follow-up orthopaedic clinic visits 6 weeks and then 3, 6 and 12 months post discharge. Cummings et al. (1988) visited patients in their homes 6 months following fracture and administered a questionnaire to them. Ceder et al. (1979) had patients visited by a physiotherapist one year post fracture; the therapist administered a questionnaire to determine the patients' ADL independence. In a further study (Ceder, Thorngren and Wallden, 1980) patients were visited throughout the year following fracture by a physiotherapist. The therapist's role

was to assess and encourage the patients. At one year, the therapist conducted a telephone interview with each patient to determine ADL independence.

Use of telephone interview in determining ADL independence

As stated above, information regarding ADL independence among individuals who have fractured hips has been collected by means of telephone interviews. This method of data collection has proven reliable and valid in both general surveys and studies of ADL independence.

Bradburn and Sudman (1979) report the results of an investigation into the accuracy of data obtained through face to face and telephone interviews. Four different questions with varying levels of threat were asked to a sample of 50 individuals each; in all instances the true response was known. During the interviews each subject's anxiety was measured.

Telephone interviewing yielded the highest interview completion rate. When the questions were relatively non-threatening, the face-to-face condition produced data with slightly lower distortion than that gained from the telephone interviews. When the questions became more threatening, there were more errors in the face-to-face interviews. Data from the telephone interviews did not appear to be affected by the respondent's anxiety level; data from the face-to-face interviews were more distorted when the subjects were

anxious.

The use of a telephone interview to measure ADL status in longitudinal studies was recommended by Shinar and associates (1987) following their study of this technique. Seventy-two individuals who had suffered a stroke were questioned regarding their ADL independence using a telephone interview based on the Barthel Index. In one half of the cases the subjects could not speak on the phone and the questions were answered by a surrogate. All telephone interviews were carried out 5 to 8 days before a scheduled hospital follow-up appointment. During this appointment, the subjects were observed performing ADL activities and rated using the Barthel Index.

Pearson r coefficients for the correlation between telephone interview and performance evaluation were .99 for the total sample, .97 for all patients who answered the telephone questionnaire themselves and .99 for the surrogates who responded. Spearman rho coefficients for individual test items ranged from a low of .70 for the correlation between the subjects' responses to the question regarding bathing and the hospital assessment of this activity to 1.00 for a number of items responded to by both the patient and surrogate groups. When the total sample was considered the individual item correlations ranged from .85 to 1.00.

Telephone interviews have been used to measure functional outcomes of individuals who have had hip fractures both before and after Shinar's study was published. Ceder, Thorngren and Wallden (1980) followed 103 hip fractured patients with a physiotherapist's telephone interview 12 months post discharge. Mossey, Mutran, Knott and Craik (1989) followed 219 women who had fractured hips using a telephone interview 12 months post surgery. Both of these studies followed healthy hip fractured patients who were discharged to their own homes; both studies found that approximately one third of these individuals were independent in ADL at follow-up. The similarities of these findings lend support to the reliability of the telephone follow-up procedure.

While the two previous studies utilized telephone interviews based on the Katz Index of ADL (Katz et al., 1963), at least one other outcome study has used interviews modeled on the Barthel Index. Forer and Miller (1980), using this technique, followed 192 rehabilitation patients 12 to 19 months post discharge.

Therefore, it appears that telephone interviewing is a reliable and valid method of data collection regarding ADL independence in hip fractured and other patient populations. Although the Barthel Index has not, to date, been the basis of telephone interviews with individuals who have fractured hips,

it has formed the basis for such interviews of individuals with other medical problems.

Role function and ADL performance

It has been suggested that in order to predict whether or not individuals who are disabled will continue to carry out certain activities, such as ADL, following a rehabilitation program, one must determine whether these activities are a meaningful part of their social roles (Williams, 1987). Occupational therapists using the model of human occupation (Kielhofner and Burke, 1985) recognize that an individual's roles serve to organize and maintain patterns of behavior. Loss of a social role might lead to a disintegration of behaviors which supported and were reinforced by that role. Therefore, examination of an individual's expectations regarding his or her roles following hospital discharge may help the therapist predict whether ADL independence observed during the occupational therapy program would be maintained at home.

Variables which might confound any relationship between loss of role functions and less independent ADL performance at home include any factors which are associated with role loss and which, in and of themselves, are risk factors for less independent ADL performance at home. Depression is believed to be associated with role loss (Barris, 1985) and has been suspected as a factor in poorer post discharge ADL

independence (Andrews and Stewart, 1979). Similarly, lack of social support has been implicated in less independent ADL performance at home (Thomas and Stevens, 1974), and is bound to social roles and role loss (Blau, 1981).

Admission to a nursing home or long term care facility may lead to role loss (Lewis, 1979). Such institutional placement has also been associated with decreased ADL independence following discharge when care staff carry out activities which the resident may be capable of managing given the opportunity to do so (Miller, 1983).

A number of other possible confounders of the relationship between role loss and less independent ADL performance at home are proposed from the literature and clinical reasoning. Mental status changes may be associated with decreased ADL independence post discharge; the individual with memory problems may be unable to recall the sequence of events required for independent ADL performance without the cuing which was provided by the occupational therapist while he or she was in hospital. Such an individual would therefore be unable to carry out ADL tasks without the help of another individual. At the same time, a decline in mental functioning may lead to role loss (Oakley, 1987).

Reduced health status may lead to social role loss (Kielhofner et al., 1985). As well, reduced health status has

been implicated in connection with less independent ADL performance following discharge (Thomas and Stevens, 1974). Davis (1988) notes that motivation to strive for rehabilitation goals, which include maintained ADL independence, may be low if the older individual is battling "fatigue, discouragement with slow progress, and the stress of multiple intrinsic changes" (pp. 749-750). She implies that the patient in poor health may stop progressing or regress once he or she is no longer being monitored by the therapist.

Therefore, to gain a clear picture of the association between role loss and poorer post discharge ADL independence, one must also consider depression, social support, mental status, health status and institutionalization.

Pre and post discharge ADL independence and the model of human occupation

These five factors can also be examined for their relationships within the model of human occupation. As previously outlined, the model holds that human beings are open systems existing within certain environments. These open systems are made up of three hierarchical subsystems: volition, habituation and performance. Higher levels determine the activities which are produced by the lower levels, while lower levels constrain the activities which can be produced following their initiation by the higher levels.

A depressive state can influence the occupational performance of the individual (Barris et al., 1985). This relationship is probably mediated through the profound effects of depression on the volitional subsystem. The volitional subsystem is made up of energizing and symbolic components. The energizing component is the individual's inate drive to explore and master the environment. The symbolic components include interests, values and feelings of personal causation (Kielhofner and Burke, 1985).

All of these components are adversely affected by depression (Barris et al., 1985). The depressed person may deny having any interests; previously held values may be seriously questioned or abandoned. Locus of control is often externally focused in the depressed individual leaving him or her little feeling of control over external events. These adverse effects on the components of the volitional subsystem tend to render it dysfunctional and impotent in initiating occupational behavior such as self-care. This loss of ability to initiate action would lead to a decrease in occupational performance despite the presence of the physical and mental skills required for task performance and the roles and habits required to organize activities.

As outlined previously, the next subsystem, habituation, is comprised of roles and habits. It allows for the maintenance

of regularly performed occupational behavior. If dysfunctional, one would predict that occupational behavior, such as ADL performance, would not take place despite the presence of the physical and mental abilities required. For example, an individual might have the physical and mental abilities required for the role of caregiver to grandchildren. However, if the individual no longer holds an internalized image of himself or herself in this role, it is unlikely that he or she would carry out the activities involved. These activities might include putting on shoes and socks and an outercoat, traveling to the children's home by bus, walking with the children to a park and/or preparing a meal.

The lowest of the subsystems, the performance subsystem, is comprised of the component skills required to carry out tasks once they are initiated and organized. These include such components as physical strength and endurance (represented in this study by general health status) and mental abilities. Dysfunction in these areas may constrain the performance of occupational behavior, unless the individual has discovered some way to adapt to or overcome the debility.

Of course, these subsystems are part of the human open system. As in any open system, the human system is affected by the environment. During the predischarge ADL assessment, the patient is in the hospital environment and is under the

supervision and influence of the occupational therapist. The individual's home environment is influenced by his or her social supports or lack thereof. It could be predicted that occupational behavior in an individual who is an open system, would differ within these two different environments. For example, a rather cautious individual may perform more independently in ADL tasks in the presence of an occupational therapist who encourages the individual to carry out activities which the individual believes would be unsafe if carried out independently. At home, without such encouragement, this individual may rely on the help of a spouse, or fail to carry out the activity at all.

Given all of these interacting factors, the following predictions may be made. An individual who has demonstrated the ability to carry out an ADL task independently, that is, an individual who has demonstrated that his or her performance components are intact, may fail to perform such a task independently in the absence of the therapist if there has been a disruption in his or her volitional system (for example, depression) or habituation subsystem (for example, role loss). The individual's ADL performance may also be affected by his or home environment, including characteristics of his or her social support.

Summary

The assessment and retraining of ADL are an important part of occupational therapy intervention with individuals who have fractured hips. To date, follow up studies have outlined expected ADL independence 6 and 12 months following hip fracture. However, researchers have not determined how predischarge ADL independence compares to post discharge ADL independence. Studies involving other patient groups have demonstrated that significant numbers of patients do not perform as independently in ADL at home as they did during in-hospital assessments. This phenomenon may also occur in the hip fractured population.

Although previous studies have uncovered discrepancies between home and hospital ADL independence, they have not clearly identified factors which could be used to predicted less independent home performance. Role loss may be associated with less independent ADL performance at home. Factors which might confound any relationship between role loss and post discharge decline include institutional placement, depression, mental status, health status and social support.

Method

A prospective design was used in this study. In this type of study, a group of individuals are followed over a period of time for the development of the outcome of interest. Information regarding exposure to potential risk factors for this outcome is collected for each subject. At the end of the follow-up period, the data are analyzed to determine whether exposure to any of the potential risk factors was more common among the individuals who developed the outcome of interest than for the individuals who did not. In this way, a relationship between the risk factors and the outcome of interest can be asserted or refuted (Hennekens and Buring, 1987). In this study the outcome of interest was ADL performance at home which was less independent than ADL independence noted on the predischarge assessment. The potential risk factors were role loss, depression, mental status, health status and social support.

Older adults receiving in-patient occupational therapy following hip fracture, who were returning to a non-institutional setting following discharge, were assessed for role loss, social support, mental status and general health status. Prior to discharge their ADL independence was assessed. Three weeks following discharge their ADL independence at home was determined.

Subjects

The study population consisted of a convenience sample drawn from the geriatric rehabilitation unit of the Edmonton General Hospital (EGH) and the orthopaedic units of the Foothills (FH), Calgary General (CGH), Holy Cross (HC), and Rockyview (RH) Hospitals. All individuals 65 years of age and older, whose anticipated discharge location was not an institution, were asked to participate in this study. Patients were judged as having received occupational therapy if they were seen by an occupational therapist for at least 30 minutes of direct care during at least one treatment session. The first 61 patients who agreed to participate in this study and could complete the assessment battery made up the study population. (See Appendix I for sample size calculation).

Procedure

Age and sex were recorded for those eligible individuals who did not wish to or could not participate in the study (See Appendix II for letter of consent).

Data collection from the study subjects was as follows. During the 3 days prior to each subject's anticipated discharge from hospital, the research or treating occupational therapist administered tests of mental status, depression, social support, health status and anticipated role loss. She also recorded the subject's age and sex. Each patient's ADL status was assessed

by the treating occupational therapist during this 3 day period. Three weeks following discharge the patient's ADL independence at home was assessed by the research occupational therapist. The battery of assessment tools is described below.

To ensure interrater reliability among therapists assessing patients with the Barthel Index, the following procedures were carried out. All of the therapists using the Barthel Index to assess ADL independence took part in a one hour training session. Prior to the session they read the standard instructions for the application of this test (McDowell and Newell, 1987). During this training session standard procedures for application of the test were reviewed. Testers were asked to rate the predischarge ADL independence of a simulated hip fractured patient from a written description of her performance. Ratings were reviewed by the research occupational therapist. Deviations from the protocol were called to the attention of the concerned tester. Testers rated four further simulated patients and received feedback regarding their ratings. Simulations were constructed so as to highlight areas of potentially different interpretations of the rating scale. Excellent adherence to the scoring protocol and agreement between raters were achieved during the last two simulations.

Assessment tools

ADL independence

The Barthel Index (BI) (Mahoney and Barthel, 1965) (Appendix III) is a 10 item rating scale which includes feeding, transfers from bed, grooming, bathing, mobility, stair climbing, dressing and bowel and bladder continence. Scoring is done in increments of 5 points; some items are more heavily weighted than others for a total possible score of 100. The tool can be used for descriptive, evaluative and predictive purposes (Law and Letts, 1989). A test-retest reliability of .92 has been demonstrated on a sample of individuals of varying diagnoses attending a rehabilitation center (Granger, Albrecht and Hamilton, 1979). Good correlation between the BI and the Kenny and Katz ADL scales has been shown in a study of individuals who had had strokes (Donaldson, Wagner and Gresham, 1973). McDowell and Newell (1987) state that the BI is one of the best objective assessments of ADL available at this time.

The BI allows the patient the same score for independent performance of tasks regardless of the use of adapted equipment. This minimizes the likelihood of potential problems with the interpretation of scoring when equipment is used (Kaufert, 1983). Although no studies could be located which used the BI to measure ADL independence in individuals

with fractured hips, the scale "measures the degree of physical impairment as it relates to basic ADL function regardless of particular diagnostic designation" (Jackson and Lang, 1983; p. 215).

Each subject's ADL independence was rated by the treating occupational therapist during the 3 days prior to discharge. Post discharge ADL independence was rated by the research occupational therapist using a telephone interview 3 weeks following discharge. Telephone interviews using the BI have been demonstrated to be a valid method of assessing ADL independence (Shinar et al., 1987). Ten patients from the Foothills Hospital also received a face-to-face ADL interview to measure the agreement between these two methods of data collection.

Role loss

Role loss was assessed using the first part of the Role Checklist (RC) (Oakley, Kielhofner, Barris and Reichler, 1986) (Appendix V); this test was developed to gather information regarding an individual's occupational roles. In part 1 of the assessment, the subject is asked to check which of 10 roles he or she has held in the past, holds in the present and believes he or she will hold in the future. These roles include student, worker, volunteer, caregiver, home maintainer, friend, family member, religious participant, hobbyist and participant in

organizations. Content validity of the assessment has been demonstrated as has test-retest reliability. When 60 subjects aged 31-79 were administered this assessment twice within an 8 week period, an overall weighted Kappa of .53 was found. (Oakley et al., 1986).

In this study subjects were asked which roles they participated in during the month before their fracture and which roles they expect to participate in following discharge. The number of roles lost following hip fracture were recorded.

Depression

Depression was measured using the Geriatric Depression Scale (GDS) (Yesavage et al., 1983) (Appendix VII). This scale is a 30 item yes-no response questionnaire which takes approximately 5 minutes to complete. The test has been shown to have internal consistency (Cronbach's alpha = 94%) and good test-retest reliability when re-administered within one week to a community sample of older adults (Yesavage et al., 1983). The test was recently validated with a group of medically ill elderly men (Koenig, Meador, Cohen and Blazer, 1988). Using a cut-off score of 11 to identify presence of major depression, the test demonstrated a sensitivity of 92% and a specificity of 89% as compared to assessments made by a geriatric psychiatrist on the basis of interview data.

Lyons, Strain, Hammer, Ackerman and Fulop (1985)

demonstrated the reliability and validity of this assessment when used with older hip fractured patients. They demonstrated a Pearson r of .81 of scores on the GDS and the Hamilton Depression Rating Scale, when 54 patients were administered both tests within 48 hours of discharge. These authors also examined the stability of GDS scores over the length of hospitalization. Fifty-seven patients responded to the GDS within 69 hours of surgery post hip fracture and then again within 48 hours of discharge. A correlation between the two tests of .98 was demonstrated. Thus, the GDS appears to be a reliable and valid measure for identifying depressed individuals among patients with hip fractures.

Mental status

The Short Portable Mental Status Questionnaire (SPMSQ) (Pfeiffer, 1975) (Appendix IX) was used to assess mental status. This instrument is a 10 item test which taps a range of mental functions. Scoring guidelines allow for differences in education level. Test-retest reliability of .82 and .83 has been demonstrated by the author. As well, when test scores were compared with psychiatric diagnoses of organic brain syndrome in a group of 133 individuals referred to a geriatric clinic for assessment, the test demonstrated a sensitivity of 68% and a specificity of 96% (Pfeiffer, 1975).

Because the study was done in Canada, two of the

questions, "Who is the president of the U.S. now?" and "Who was president just before him?" were modified to read, "Who is the prime minister of Canada now?" and "Who was prime minister just before him?". The former prime minister of Canada, John Turner, was prime minister for only 4 months. He was never elected prime minister. He became prime minister by virtue of the fact that he was elected leader of the Liberal Party following Pierre Trudeau's resignation. Because this is a rather confusing period of Canadian political history, subjects were given a correct score if they responded to the question, "Who was prime minister before him?" with either Turner or Trudeau.

General health status

Subjects were asked to rate their general health status as excellent, good, fair, poor or bad (Appendix XII). Health self-ratings have been found to be reliable (Meltzer and Hochstin, 1970).

Three main strategies have been used in studies to validate self-ratings of health as a measure of general health status. Kaplan and Comacho (1983) outline these strategies, their inherent problems and the findings of associated studies. Physician ratings have been compared to individuals' ratings of their own health. While correlations between the two have been moderate but significant, Kaplan and Comacho argue that

the clinical measures used by physicians vary widely as do the ability of these procedures to accurately diagnose pathology and predict future illness. The simple measure of self-rated health status was found to be a better predictor of early mortality than more objective measure of health based upon physician ratings and health service utilization (Mossey and Shapiro, 1982).

In the second strategy used to validate self-rated health as a measure of general health status, perceived health and functional abilities have been compared resulting in substantial correlations. However, Kaplan and Comacho argue that functional ability is a measure of both physical and mental health status. That is, an individual's functional abilities indicate the severity of his or her physical problems along with his or her ability to cope with these problems.

As a third strategy used to validate self-rated health, multiple factors such as age, sex, marital and employment status have been measured and correlated with self-rated health. However, few attempts have been made to examine how these factors confound one another.

Kaplan and Comacho subsequently argue that their prospective study of self-rated health and 9 year mortality in 6928 adult subjects overcame these problems. They found a significant relationship between self-rated health and mortality

even when they controlled for factors such as social support and depression and such high risk health behaviors as smoking. Furthermore, there was a trend of increasing mortality as self-rated health decreased which held over all age groups. They concluded, therefore, that self-rated health status is an excellent measure of health status.

Social support

Part 2 of the Personal Resource Questionnaire (PRQ) (Appendix XII) was used to assess the quality of social supports (Brandt and Weinert, 1980). This scale is a 25 item questionnaire. It is based on Weiss's conceptualization of social support (cited in Brandt and Weinert, 1980) which views this construct as as relational process made up of five main functions: i) the feeling that one is a valued member of a group; ii) perception that one is a necessary part of the group; iii) opportunity for intimacy; iv) opportunity to be nurturing and ; v) provision of informational, practical and emotional support. The subject is given five statements regarding each of the social support functions and is asked to rate his or her agreement on a 7-point scale.

This scale was tested by the authors using a group of 149 white, middle class spouses of individuals with multiple sclerosis. An internal consistency of .89 was found; internal consistency for each of the subscales ranged from .61 to .77

with four of the subscales scoring at least .70. Content validity was assessed by experts in the area of social support. Construct validity was supported by significant negative correlations between the test and a scale measuring self-help ideology.

Analysis

The concordance between predischarge and post discharge ADL independence was determined through the calculation of a weighted Kappa. This statistic indicates the magnitude of agreement between two ordinal scores, corrected for chance. Kramer and Feinstein, (1981) describe this statistic and recommend that .50 be set as a baseline for good concordance.

The number of subjects who demonstrated less independence in ADL at home than they demonstrated on the the predischarge assessment (i.e. the number of subjects whose post discharge BI scores were at least 5 points less than their predischarge BI scores) was divided by the total number of patients in the study. This proportion was expressed as a percentage.

The relationships between poorer post discharge ADL independence and the potential risk factors were analyzed. In order to properly assess their confounding abilities, covariables must be examined together (Kleinbaum, Kupper and

Morgenstern, 1985). Therefore logistic regression was utilized to examine the relative influence of each of the independent variables (i.e. role loss, depression, mental status, health status and social support) on the dependent variable (less independent post discharge ADL performance).

Logistic regression is a method of examining the association between co-existing independent variables and a nominal dependent variable (Hennekens and Buring, 1987). A mathematical model of their relative influence on the dependent variable is constructed. This model is then used to reflect the extent to which each independent variable can predict the dependent variable, while the influence of the remaining variables is held constant. In this way the confounding abilities of the independent variables can be examined. From this analysis, the relative risk of less independent post discharge ADL performance associated with each of the independent variables was calculated.

Results

Pre and post discharge ADL assessments were carried out for 61 subjects. Thirteen (21.3%) of the subjects were men and the remaining 48 (78.7%) were women. The subjects' ages ranged from 65 to 92 years; the mean age was 76.6 years (S.D. = 7.4 years) (Table 1). Six potential subjects declined involvement in the study. These individuals were all female. Their average age was 82.3 years. Four other potential subjects were unable to complete the battery of tests. Three were female and one was male. Their average age was 83.5 years.

The study subjects were of average age and sex for individuals who have fractured hips. Kumar and Redford (1984) report that the average age of hip fractured patients is 70 to 80 years and that females are affected 2.4 to 4 times more frequently than males. In this study, the average age was 76.6 years. There were 3.7 times as many women as men. Therefore, the subjects were similar in age and sex distribution to the general population of hip fractured individuals.

Concordance between pre and post discharge ADL independence

The first aim of this study was to determine the concordance between predischarge ADL assessments and post discharge ADL independence in individuals with hip fractures.

In order to ensure the similarity of the results of telephone and face-to-face interviews in this study, 10 subjects from the Foothills Hospital received face-to-face as well as telephone post discharge interviews. The concordance between the two assessments was determined using weighted Kappa (Kramer and Feinstein, 1981). The concordance was found to be .75. This agreement exceeds the authors' criterion for good concordance ($\geq$ .50). This indicates that the results of telephone and face-to-face interviews were quite similar for the study population.

Predischarge Barthel scores ranged from 70 to 100 with a median of 90. Post discharge Barthel scores ranged from 40 to 100 with a median of 85. All sets of scores were placed in a contingency table in which each cell was weighted for the level of disagreement between the corresponding pre and post discharge BI scores. Pre and post discharge scores which were in perfect agreement received a weighting of zero, pre and post discharge scores which varied by one category (i.e. 5 points) received a weighting of one, pre and post discharge scores which varied by two categories (i.e. 10 points) received a weighting of two, and so on. All sets of scores fell within seven categories of disagreement except two. In the first, the predischarge BI score was 95 and the post discharge BI score was 50. In the second the predischarge BI score was 75 and

the post discharge BI score was 40. Concordance calculations were carried out with and without these potential outliers. The concordance between pre and post discharge scores was K_W = .225 (K_W = .223 without potential outliers). This did not meet the criterion for good concordance as set out by Kramer and Feinstein (1981).

Approximately 100 subjects are required to assume a normal distribution of scores in order to calculate the standard error of K_W and determine the statistical significance of K_W, given the seven levels of disagreement (Cicchetti and Fleiss, 1977). While there were less than 100 subjects in the study sample, a normal distribution was assumed in order to carry out significance testing. The level of concordance was found to be statistically significant when the data is considered both with and without outliers ($z = 2.13$; $p < .05$; $z = 2.08$; $p < .05$). Therefore, a weak but statistically significant concordance did exist between pre and post discharge BI scores.

Correlation coefficients were also calculated for the pre and post discharge BI scores. The results of these calculations with and without outliers are .325 ($p < .01$) and .344 ($p < .01$).

The data were further examined in order to determine in which tasks subjects demonstrated the most discrepancy between pre and post discharge independence. The results of this individual item analysis are shown in Table 2.

Independence in feeding, washing, toileting and bowel and bladder continence was relatively stable pre and post discharge. In contrast, subjects less frequently demonstrated the same level of independence pre and post discharge in stair climbing, walking, bathing, dressing and transfers.

Proportion of individuals who demonstrated less independent post discharge function

The second aim of this study was to determine the proportion of individuals with fractured hips who performed ADL less independently post discharge than they did during predischarge assessments. Differences in individuals' pre and post discharge scores ranged from -45 to +20 points on the BI (Table 3). Thirty-one (50.8%) of the subjects demonstrated lower post discharge BI scores of 5 or more points. Fourteen (23.0%) demonstrated lower post discharge BI scores of 10 or more points.

Pre and post discharge BI scores on specific ADL tasks were examined to determine the proportion of patients whose post discharge independence was better, unchanged or worse in each task (Table 2). No subjects demonstrated poorer post discharge function in toileting and bowel and bladder continence. Less than 10% of the subjects demonstrated less independent post discharge performance in feeding, washing and transfers. Larger proportions of subjects demonstrated

less independent post discharge performance in dressing (13.1%), walking (24.6%), bathing (37.7%) and stair climbing (47.5%).

Relationship between less independent post discharge ADL and potential risk factors

The final aim of this study was to determine whether role loss, depression, social support, mental status or general health status are associated with less independent post discharge ADL performance. Results of the assessments of role loss, depression, mental status, health status and social support are outlined below.

Scores on the GDS ranged from 0 to 20 out of a possible 30, with a median of 6 and a mean of 7.5 (S.D. = 4.7). Of 61 subjects assessed, 14 (23.0%) scored 11 points or higher and were therefore judged to be depressed (Table 4).

Of the 61 subjects assessed, 36 (59.0%) reported no expected role loss, 20 (32.8%) reported expected loss of one role, 4 (6.6%) reported expected loss of 2 roles and 1 (1.6%) reported expected loss of 3 roles (Table 5).

Ratings on the SPMSQ ranged from intact to moderately impaired mental status. Of 61 subjects examined 51 (83.6%) received a rating of intact, 8 (13.1%) demonstrated mild impairment and 2 (3.3%) demonstrated moderate impairment (Table 6). None of the subjects demonstrated severe

impairment.

Of the 61 subjects questioned 17 (27.9%) reported excellent health, 34 (55.7%) reported good health, 8 (13.1%) reported fair health and 2 (3.3%) reported poor health. None of the subjects reported bad health (Table 7).

The measure of social support used, the PRQ, has a maximum score of 175 which denotes excellent social support. On this assessment the median score was 145 with a range from 83 to 175. The mean score was 141.3 (S.D. = 20.1). In order to compare age and sex distribution of social support subjects were categorized as having poor social support, if their scores were 140 or less, or good social support if their scores were 141 or more (Table 8).

The data were further examined to determine whether there were any statistically significant differences between mean changes in ADL scores (post discharge ADL minus predischarge ADL) observed at each of the participating facilities. This analysis was carried out to ensure that differences between pre and post discharge BI scores were similar for patients across facilities and were not specific to any one facility.

Analysis of variance was carried out using the difference between individual subjects' pre and post discharge BI scores as the dependent variable and site of treatment as the

independent variable (Table 9). Overall variation between groups was not significant ($p < .07$). However, the small sample size must be taken into consideration when interpreting these results. While the p value for overall variation does not reach .05, it does approach significance and the mean ADL change of patients from Facility C appears to be different from that of the other facilities. Therefore, although the differences between pre and post discharge scores could be considered relatively similar across facilities given the results of the calculation of analysis of variance, it is possible that subjects from Facility C may have been rated differently.

To determine whether or not there was an association between less independent post discharge function and role loss, depression, mental status, health status or social support, logistic regression was carried out and the odds ratios of less independent ADL performance post discharge associated with each of the five potential risk factors, as well as age and sex, were determined (Table 9).

These calculations were carried out using the computer program Egret (Statistics and Epidemiology Corporation, 1990). Prior to the analyses role loss was categorized as no roles lost (0) or one or more roles lost (1), depression was categorized as absent (0) or present (1), mental status was categorized as intact (0) or mild/moderate impairment (1), and health status

was categorized as excellent/good (0) or fair/poor (1). Social support was run as a continuous variable. The lowest score, 83, designated the poorest social support and the highest score, 175, designated the best social support.

Change in post discharge ADL independence (post discharge BI score minus predischarge BI score) was entered as the dependent variable. Changes of 0 or more were entered as 0, changes of -5 or less were entered as 1. Age and sex were the first independent variables entered. Females were found to be at greater risk of less independent post discharge ADL ($OR = 5.39$; $p < .05$). There was no significant association between age and less independent post discharge ADL.

Next depression, role loss, mental status, health status and social support were added one at a time, along with age and sex. Odds ratios, confidence intervals and significance levels were calculated for each of the independent variables. These indicated that there were no statistically significant relationships between any of the five independent variables and less independent ADL function post discharge, controlling for age and sex. Therefore, none of the variables could be considered risk factors for less independent post discharge ADL performance.

In interpreting the results of this analysis the small size of the sample must be taken into consideration. It is possible

that one or more of the relative risks may have been found significant given a larger sample size and associated smaller standard errors.

A number of post hoc analyses were carried out to identify any variables which might warrant further investigation for their relationship with less independent post discharge performance. Specifically, chi square analyses were carried out using the five previously examined independent variables as well as sex and age. Two dependent variables, less independent post discharge performance of 5 or more points and less independent post discharge performance of 10 or more points, were examined. Less independent post discharge performance of 10 or more points was used as a dependent variable because it was felt that a decrease of 10 or more points may represent a more clinically significant phenomenom (see Discussion). Only one significant relationship was identified. Sex was associated with less independent post discharge performance by both 5 or more or 10 or more points ($x^2 = 5.09$; $p < .05$ and $x^2 = 4.92$; $p < .05$ respectively). The relative risks for each outcome associated with being female were 2.52 and 10.4 (Table 11).

Table 1

Age and sex distribution

	Age			
	65 - 74		75 +	
	n	%	n	%
Male	6	26.1	7	18.4
Female	17	73.9	31	81.6
Totals	23	100	38	100

Table 2

Pre and post discharge BI scores by individual ADL tasks

	Post discharge status		
Task	More independent (%)	Unchanged (%)	Less independent (%)
Feeding	NA[a]	98.4	1.6
Transfers	19.7	73.8	6.6
Washing	NA[a]	98.4	1.6
Toileting	1.6	98.4	0
Bathing	3.2	59.0	37.7
Walking	27.9	47.5	24.6
Stair climbing	19.7	32.8	47.5
Dressing	18.0	68.6	13.1
Continence	0	100.0	0

[a]All subjects were rated independent in these activities predischarge.

Table 3

Post minus predischarge BI scores (ADL change)

Score difference	No. of subjects	%
-45	1	1.6
-40	0	0
-35	1	1.6
-30	1	1.6
-25	2	3.3
-20	4	6.6
-15	5	8.2
-10	1	1.6
-5	15	24.6
0	13	21.3
+5	9	14.8
+10	5	8.2
+15	3	4.9
+20	1	1.6

Table 4

Distribution of depression by age and sex

	Males				Females			
Age	65-74		75+		65-74		75+	
Depression	n	%	n	%	n	%	n	%
Present	2	(33.3)	1	(16.7)	2	(13.3)	9	(40.9)
Absent	4	(66.7)	6	(83.3)	15	(86.7)	22	(59.1)
Totals	6	(100)	7	(100)	17	(100)	31	(100)

Table 5

Distribution of role loss by age and sex

	Males				Females			
Age	65-74		75+		65-74		75+	
Roles lost	n	%	n	%	n	%	n	%
One or more	3	(50.0)	3	(42.9)	8	(47.1)	11	(55.0)
None	3	(50.0)	4	(57.1)	9	(52.9)	20	(45.0)
Totals	6	(100)	7	(100)	17	(100)	31	(100)

Table 6

Distribution of mental status by age and sex

	Males				Females			
Age	65-74		75+		65-74		75+	
Mental status	n	%	n	%	n	%	n	%
Intact	5	(83.3)	6	(85.7)	16	(94.1)	24	(77.4)
Mild impairment	0	(0)	1	(14.3)	1	(5.9)	6	(19.4)
Moderate impairment	1	(16.7)	0	(0)	0	(0)	1	(3.2)
Totals	6	(100)	7	(100)	17	(100)	31	(100)

Table 7

Distribution of health status by age and sex

	Males				Females			
Age	65-74		74+		65-74		75+	
Health status	n	%	n	%	n	%	n	%
Excellent or good	5	(83.3)	6	(85.7)	15	(88.2)	25	(80.6)
Fair or poor	1	(16.7)	1	(14.3)	2	(11.8)	6	(19.4)
Totals	6	(100)	7	(100)	17	(100)	31	(100)

Table 8

Distribution of social support by age and sex

	Males				Females			
Age	65-74		74+		65-74		75+	
Social support	n	%	n	%	n	%	n	%
Good[a]	3	(50.0)	2	(28.6)	13	(76.5)	16	(51.6)
Poor[b]	3	(50.0)	5	(72.4)	4	(23.5)	15	(48.4)
Totals	6	(100)	7	(100)	17	(100)	31	(100)

[a] Good social support was defined as a score of 141 or greater.

[b] Poor social support was defined as a score of 140 or less.

Table 9

Number of subjects and mean ADL change by treatment site

Site	Number of subjects	Mean ADL change	S.D.
A	3	-18.3	23.6
B	33	-4.8	12.4
C	11	3.6	9.5
D	9	-3.3	9.7
E	5	-7.0	4.6

$F(4, 56) = 2.29;\ p < .07$

Table 10

Association between potential risk factors and less independent post discharge ADL (5 or more points)

Variable	Odds ratio	95% Confidence Intervals	p values
Age	0.95	0.32 - 5.24	.76
Sex	5.39	0.33 - 1.55	.02
Depression	1.07	0.30 - 3.80	.92
Role loss	0.43	0.14 - 1.32	.14
Mental status	2.37	0.50 - 11.12	.28
Health status	1.63	0.38 - 7.00	.51
Social support	1.00	0.97 - 1.03	.98

Coding of categorized variables: Sex (male = 1, female = 2); Depression (not depressed = 0, depressed = 1); role loss (no roles lost = 0, 1 or more roles lost = 1); Health status (excellent/good = 0, fair/poor = 1).

Table 11

Relative risks of ADL change

	ADL change			
	5 or more points		10 or more points	
Variable	Relative risk	p value	Relative risk	p value
Age	1.09	.52	1.02	.67
Sex	2.53	.02	10.04	.03
Depression	0.98	.94	0.56	.38
Role loss	0.74	.37	1.18	.73
Mental status	1.22	.53	0.85	.80
Health status	1.22	.53	2.04	.16
Social support	0.87	.69	0.76	.68

Coding of categorized variables: Age (65-74 = 0, 75+ = 1); Sex (male = 1, female = 2); Depression (not depressed = 0, depressed = 1); role loss (no roles lost = 0, 1 or more roles lost = 1); Mental status (intact = 0, mild/moderate impairment = 1), Health status (excellent/good = 0, fair/poor = 1); Social support (good social support = 0, poor social support = 1).

Discussion

Limitations

This study had four primary limitations. These are lack of information concerning when individuals who have fractured hips become stable in ADL independence, the possibility of error among the subjects in reporting post discharge ADL independence, the non-random sample and the limited sample size.

Little is known regarding the time at which individuals who have fractured hips become stable in their ADL independence. Three weeks was chosen as the time to measure post discharge ADL independence in this study for the following reasons. In a recent study of ambulation following hip fracture, it was determined that walking ability becomes stable at approximately 6 weeks post fracture (Cheng et al., 1989). Given a post fracture hospitalization of 3 weeks, patients seen 3 weeks post discharge would be stable in this regard. As well, when Ceder et al. (1980) assessed dressing and hygiene independence in adults with hip fractures at 5 weeks and 4 months post fracture, little change was observed from one time period to the next.

Additionally, it was reasoned that the 3 week post discharge period would allow the individual to become resettled in the home. Family and other informal supports who

rallied round the patient at the time of discharge may have discontinued such crisis intervention at 3 weeks. The individual's true independence in ADL would have been more apparent following such a withdrawal.

In this study, measurement of post discharge ADL independence was carried out by questioning the patient. It was therefore subject to error. Subjects may have rated themselves more or less independent than they actually were. It is possible that patients may have reported greater independence, out of fear of being rehospitalized. However, each subject was reassured that the information obtained would not be used outside of the study; it was felt that once the subjects had this reassurance they felt comfortable giving the investigator accurate information regarding their independence in ADL.

Patients may have rated themselves less independent than they actually were. Some researchers believe that patients' self-reports tend to be lower than therapists' ratings (McDowell and Newell, 1987). McGinnis, Seward, DeJong and Osberg (1986) compared 30 rehabilitation patients' self reports of ADL independence on a modified BI with ratings made by their physical and occupational therapists. These assessments were all made just prior to discharge. Patients' ratings were lower than therapists' ratings, although the authors do not

report the mean difference.

McGinnis and her colleagues demonstrated that patients may give themselves lower ratings of independence than therapists would. These authors do not directly address the question of which assessment of independence is more valid. In this study of adults with hip fractures, one of the primary objectives was to determine the concordance between predischarge ADL assessments and post discharge ADL independence. No reasons could be found for not believing the patients' self-reports. It is possible that therapists tend to rate patients somewhat more independent than they actually are. Such an interpretation of McGinnis' findings does not challenge the accuracy of patients' self-reports of independence.

One further measurement issue should be discussed. Predischarge assessments were carried out by eight different raters and post discharge assessments were carried out by an additional rater. There is the possibility that error was introduced due to the number of different individuals carrying out the ratings. However, all raters participated in a training session prior to using the BI. At the end of this session all raters were demonstrating excellent agreement. The post discharge rater used a telephone interview to measure ADL independence. While this procedure was different from the observation method used predischarge, BI performance-based

and telephone interviewed-based assessments have demonstrated excellent agreement (Shinar et al., 1987). Possible discrepancies due to differences between therapist ratings and self-reports were addressed above.

Study subjects were not randomly selected. Rather they were a convenience sample of elderly hip fractured patients in four of Calgary's five general hospitals and the geriatric rehabilitation unit of one of Edmonton's five general hospitals who consecutively attended occupational therapy. However, it was unlikely that these individuals were not representative of the older hip fractured population in these areas. Data was collected over an 11 month period. Therefore the sample was not heavily weighted towards longer stay patients. As well, all seasons were represented in the sample.

Finally, there were only 61 subjects in this study. Relationships between role loss, depression, mental status, health status, and social support and less independent post discharge ADL performance were, therefore, subject to wide variability, as noted in the confidence intervals. Also, these estimates may not have attained statistical significance because of the small number of subjects.

Concordance between pre and post discharge ADL assessments

The first aim of this study was to determine the concordance between predischarge ADL assessments and post

discharge ADL independence. While the agreement between occupational therapy predischarge ADL assessments and ADL independence at home post discharge was statistically significant, the level of agreement between the two was not strong.

The concordance between pre and post discharge assessments of ADL independence was $K_W = .223$ ($p < .05$). Concordance was not appreciably changed by deletion of possible outliers ($K_W = .225$; $p < .05$). Because this result was statistically significant it is evident that greater than chance agreement exists between the pre and post discharge ADL scores. However, the level of agreement did not reach the criterion for acceptable concordance (+.50) set out by Kramer and Feinstein (1981). These authors stress that the actual value of K_W is the most important piece of information to consider when determining the acceptability of a level of agreement. This is because the K_W statistic indicates how closely the two scores agree or can be used to represent one another. Two sets of scores may have more than chance agreement between them. However, the same scores may not agree closely enough that one would feel confident using one score to represent another. It is for this reason that Kramer and Feinstein (1981) recommend that the acceptability of a level of agreement be determined by examining the actual

value of K_W rather than the p value of this statistic. Using their criterion, one would conclude that while the agreement between pre and post discharge ADL scores was statistically significant, this agreement was not qualitatively significant.

Further evidence of weak agreement between the predischarge assessments and post discharge independence is given by the correlation between the two scores. Like the concordance, the correlation was weak but statistically significant (.325; $p < .01$).

Previous related studies have not directly examined the concordance or correlation between pre and post discharge ADL assessments. However, given the proportions of patients in these studies who did not function as independently post discharge, it is likely that similar weak relationships would have been found had these analyses been carried out.

Proportion of subjects who performed less independently at home

The second aim of this study was to determine the proportion of individuals who have fractured hips who do not perform as independently in ADL at home as they did during predischarge assessments. As mentioned above, previous studies have examined the proportion of patients in other diagnostic groups who experienced less independence in post discharge ADL. The findings of this study and these previous

studies are compared below.

In this study the proportion of individuals hospitalized with hip fractures who performed less independently in ADL post discharge was approximately 50%. This figure reflects the proportion of patients whose scores on post discharge ADL assessments were 5 or more points lower than their scores on predischarge assessments. Individuals who become less independent by 5 or more points on the BI would require some help or some additional help which they did not previously require in order to complete one ADL task. It may be argued, therefore, that such a change in function does not represent a clinically significant event. However, almost half of the patients who demonstrated less ADL independence post discharge, or 23% of the total study sample, demonstrated a post discharge BI score of 10 or more points below their predischarge scores. Individuals who become less independent by 10 or more points on the BI would require some help or some additional help which they did not previously require in order to complete two ADL tasks or significantly more help in one ADL task. Such a change in function, therefore, probably represents a clinically significant phenomenon.

The results of this study resemble those of previous studies which examined less independent post discharge ADL among patients with other medical conditions. Only one of

these studies addressed overall decrease in independence. Andrews and Stewart (1979) found that 52% of stroke patients were dependent at home in one or more activities which they carried out independently within an occupational therapy day hospital program.

Less independent post discharge performance in a number of specific ADL tasks has been examined in other studies. For ease of comparison, findings of the present study are given in brackets after the findings of the previous studies. Strub and Levine (1987) examined the records of 17 individuals with hemiplegia who had been discharged from hospital and were being followed by a home care agency. These investigators found a decrease in independence in bathing for 47% (37.7% in this study) and a decrease in independence in dressing for 86% (13.1% in this study) of the subjects at the time of assessment by the referral agency.

When a group of rheumatology patients was assessed for ADL independence prior to and 10 days following discharge from hospital, 21% (37.7% in this study) were found to be less independent in using the bath or shower (Haworth and Hollings, 1979). When Arenth and Mamon (1985) compared nurses' predischarge ADL evaluations of 56 oncology patients with ADL independence at home 3 weeks post discharge, they found that many patients were performing less independently

in a number of areas. Significant numbers of patients had received ratings of greater independence in stair climbing (33%) (47.5% in this study), bathing (23%) (37.7% in this study) and transfers (17%) (6.6% in this study) before discharge than they were actually managing at home following discharge.

It is interesting to compare the results of these studies in which independence in individual tasks was analyzed pre and post discharge. Bathing is a task in which many patients across diagnostic groups demonstrated less independent post discharge performance. Discrepancies between pre and post discharge independence in dressing, stair climbing and transfers, however, appear to vary depending on the individual's diagnosis. Independence in dressing was particularly subject to less independence at home in groups of individuals who had suffered strokes, while independence in transfers and stair climbing remained relatively stable (Andrews and Stewart, 1979; Strub and Levine, 1987). In contrast, many individuals with cancer and arthritis remained fairly stable in their abilities to dress but demonstrated less independence following discharge in stair climbing and some transfers (Arenth and Mamon, 1985; Haworth and Hollings, 1979).

It is likely that these differences represent an interaction between the primary performance components required to

carry out each task and the degree to which these were affected by the individual's malady. When an illness has affected the necessary performance components so profoundly that the individual is unable to carry out the activity even when cued and supervised by a therapist, ratings of independence in this activity would be similar pre and post discharge. However, when the performance components remain intact enough to allow cued and supervised performance, it is possible that the associated activity could be performed in hospital but not at home. For example, an individual whose strength, range of motion, balance and endurance have been quite adversely affected by a stroke would not be able to climb stairs during a clinical assessment; therefore there would be much discrepancy between a clinical rating of this ability and actual performance at home. However, an individual who has cancer, arthritis or a hip fracture, may not be as profoundly debilitated with regards to strength, range of motion, balance, or endurance. Under the supervision of a therapist, this individual may be able to carry out stair climbing a number of times within the clinical setting. However, once at home alone the individual may be fearful of carrying out the activity and may therefore rate him or herself as dependent in this activity.

A further related point of interest concerns the patients

in this study who performed more independently at home than they did on predischarge assessments. While many subjects received identical (21.3%) or poorer scores (50.8%) on post discharge assessments, the remaining subjects demonstrated improved performance (27.9%). The age and sex distribution for these outcomes is presented in Table 12. It could be concluded then, that while post discharge independence may be identical to predischarge independence for approximately one-quarter of these patients, most of the remaining patients will not be as independent at home, but many, too, will be more independent.

Predictors of less independent post discharge performance

The final aim of this study was to determine whether role loss, depression, social support, mental status and health status can be used to predict less independent post discharge ADL performance. No significant association between any of these variables and less independent post discharge performance was found.

It should be noted that in the logistic regression subjects were considered to have the outcome of interest, less independent ADL performance at home, if their post discharge BI scores were 5 or more points lower than their predischarge scores. However, as stated above, it is possible that only a drop of 10 or more points represents a clinically significant

phenomenon. However, when chi square analyses were carried out using a drop of 10 or more points to define less independent post discharge performance, no significant relationships were identified (Table 11).

Limitations placed on this study by the small sample size must be kept in mind. In the logistic regression associations between potential risk factors and the outcome of interest would have to have been quite strong before they were found to be significant. This may have been the greatest factor in the failure of this study to identify any risk factors for less independent post discharge ADL performance. The odds ratios associated with mental status and health status may have attained statistical significance given a larger sample size.

However, like this study, other studies have been unable to clearly identify potential risk factors for this outcome. Therefore, a number of alternative explanations for this failure to identify a risk factor are advanced.

Previous writers have attempted to explain less independent post discharge ADL performance as a result of the different measurement procedures used pre and post discharge. Others have proposed that this phenomenon is a result of some characteristic of the patient or his or her environment. Interpretation of recent work on universal outcome measures for occupational therapy (Law et al., 1990)

suggests that these discrepancies occur because standardized ADL evaluations have been task-oriented rather than client-centered. Ultimately it may be patient's values and perceptions of his or her own ability that will determine functional performance. These three different approaches are outlined below.

Influence of measurement methods

The differences found between pre and post discharge ADL independence in this study may have been a function of the use of different measurement methods pre and post.discharge. McDowell and Newell (1987) purport that, when examining the results of ADL tests, one must decide whether one is dealing with an ability measure (i.e. what the patient can do) or a performance measure (i.e. what the patient actually does do in a real life situation). These authors believe that in a comparison of actual ability to reported performance there is a tendency for the latter to be lower, at least within the elderly population.

McGinnis, Seward, DeJong and Osberg (1986) compared 30 rehabilitation patients' self reports of ADL independence on the modified BI with ratings made by their physical and occupational therapists. These assessments were all made just prior to discharge. The authors report that the patients' ratings were lower than therapists' ratings, although they do not

report the mean difference or the concordance or correlation between the two scores.

This information is required to determine whether therapists systematically rate patients as more independent prior to discharge than patients rate themselves. If this were so one would expect that therapist and patient ratings would demonstrate weak agreement but strong correlation. In this study therapist and patient ratings showed both weak concordance (Kw = .223) and weak correlation (.354). Therefore it does not appear these scores differed systematically.

As well, the results of previous studies indicate such a difference between ratings cannot account for all of the discrepancies noted between pre and post discharge assessments. In both this study and the study of oncology patients carried out by Arenth and Mamon (1985), predischarge ADL were measured using observation and post discharge ADL were measured using self-report. In contrast, Andrews and Stewart (1979) used observation to measure hospital performance and caregiver reports to measure home performance; caregivers presumably based their reports on observations of the patient's performance. In their study the home and hospital discharge data collection methods were therefore more similar than were the ones used in this study

and Arenth and Mamon (1985). Yet, even when more similar data collection methods were used, discrepancies between pre and post discharge ADL performance were found.

Moreover, the two other studies which have examined pre and post discharge ADL performance (Strub and Levine, 1987; Haworth and Hollings, 1979) used the same method of data collection to measure pre and post discharge ADL performance (i.e. observation by health care workers). Strub and Levine (1987) found that 71% of 17 subjects had become less independent in dressing, 47% in bathing and 24% in transfers. Haworth and Hollings (1979) found that 22% of 37 individuals with arthritis were less independent in bathing. These researchers found discrepancies between pre and post discharge ADL independence in many of their subjects. The fact that this phenomenon was observed, even when the same methods were used to measure ADL independence pre and post discharge, indicates that a difference in measurement methods cannot fully explain this finding.

It is possible that subjects may not yet have been stable in their levels of independence by the time of follow-up. Subjects were seen approximately 6 weeks post fracture. Independence in walking has been found to be stable by this time (Cheng et al., 1989). Independence may be stable in some self-care tasks between 5 weeks and 4 months post fracture

(Ceder et al., 1980). Therefore it is probable that ADL independence was relatively stable by follow-up.

Kaufert and his colleagues (1979) found discrepancies between patients' self-ratings of ADL independence and ratings made by general practitioners and home health visitors when more complex ADL tasks were examined. They attributed this to the raters' difficulty observing subjects carrying out complex tasks, such as walking outside or getting on a bus. They believed that when confronted with this problem, raters based their scores on how they felt the subject would manage given his or her performance on previous simpler tasks.

It is unlikely that this is a problem in studies of easily observed self-maintenance ADL. However, a related explanation may be proposed. That is, the finding of less independent post discharge performance among many patients may reflect the difference between what the subjects, in the opinion of the raters, are capable of doing safely, and what the subjects themselves actually feel they can safely carry out on a daily basis. As the perceived danger of the task increases, the number of individuals who will continue to carry it out independently decreases. Indeed, in this study, many subjects climbed stairs in the hospital during physical therapy sessions. Following discharge a number of the same subjects stated that they did not yet feel safe climbing stairs, and were, therefore,

not carrying out this activity at home.

The possibility exists that the low level of agreement between the pre and post discharge ADL assessments may have been a function of the measurement tool. It is possible that the BI is not a good instrument for these types of measurements. However, the BI has demonstrated reliability as well as concurrent validity with other ADL assessments (Donaldson, Wagner and Gresham, 1973). As well the BI has been named as one of the better ADL assessments currently available (McDowell and Newell, 1987).

It appears unlikely that the differences between pre and post discharge ADL independence found in this study were the result of the measurement methods used to determine ADL independence pre and post discharge. However, the different measurement environments may have played a role in the findings. The possible influences of environmental and patient characteristics are examined below.

Patient characteristics and less independent post discharge ADL

The differences found between pre and post discharge ADL independence in this study may have been a function of some as yet undiscovered characteristic of the patient, the home environment or a combination of the two.

Only one other study to date has tested the relationship between patient-related characteristics and less independent

ADL performance at home. Andrews and Stewart (1979) did not find a significant association between less independent home performance and age, sex, muscle strength, perceptual disorders, incontinence or depression as judged by the therapist. They did, however, find associations between less independent performance at home and passive patient attitudes and negative caregiver attitudes. Unfortunately, measurement of these variables was very subjective and the findings of this study, therefore, remain inconclusive. These factors were not directly examined in this study; caregiver attitudes may have been indirectly examined with the measure of social support. Had patient and caregiver attitudes been included in the analysis, they may have proved to be significantly related to the outcome of interest.

As well, sex was identified as a potential risk factor in the post hoc analyses. Andrews and Stewart (1979) reported no relationship between this variable and less independence in ADL at home. Strub and Levine (1987) state that they observed such a relationship but do no report whether they tested it statistically. Had this factor been examined in the present study's preliminary analysis, an important relationship may been identified.

Strub and Levine (1987) examined an environmental variable which may have been predictive of less independent

post discharge ADL independence in individuals who had suffered a stroke. These investigators believed that time between hospital discharge and continuation of rehabilitation by a home health agency would be predictive of less independence in ADL at time of reassessment by this agency. They found no such association.

At least two environmental variables which could have affected post discharge independence may have been operating in this study of individuals with hip fractures. Characteristics of the home environment may have led to the discrepancies between pre and post discharge assessments. While in hospital many subjects may have been assessed while functioning under ideal conditions. For example, hospital stairs used in the assessment of independence in stair climbing were well lit and evenly spaced. These may have contrasted sharply with the dark uneven stairs found in many older homes. Independence may have suffered for individuals who had less than ideal conditions within their own homes.

Another potential factor in the environment includes the presence or absence of home help. Individuals who were independent in carrying out an activity, such as bathing, when assessed prior to discharge, may have been dependent in this activity at follow-up because they had become dependent upon home help. It is assumed that referral to home help would

have been made taking into consideration the findings of the occupational therapy predischarge assessment. That is, individuals who were assessed as independent in ADL activities would not be referred for home help with these activities. However, it is possible that some referrals to home help may have been made independent of the occupational therapy assessment. The presence of such help may have influenced post discharge independence.

In this study, as in previous studies, no variable, or set of variables, could be identified which were predictive of less independent post discharge ADL performance. Neither depression, role loss, mental status, health status or social support successfully predicted less independent post discharge ADL performance. There are a number of possible explanations for this.

Some of the measurement methods used to measure potential risk factors in this study may have resulted in this finding. Post discharge role loss was calculated using the patient's predictions of the number or roles which would be lost because of the fracture; no attempt was made to determine whether these predictions had been correct. As well, the impact of the volitional subsystem was estimated by examining depression. Depression, however, only indirectly measures the health of the volitional subsystem. Other more

direct measures, such as locus of control, may have demonstrated a significant association with less independent post discharge ADL performance. Again it should be mentioned that significant relationships between role loss, depression, mental status, health status and social support and less independent post discharge performance may have been identified given a larger sample.

This study failed to identify any characteristics of the patient or his or her environment which are predictive of less independent post discharge ADL. However, further examination of patient and caregiver attitudes, the home environment, the influence of home help and more direct measurement of volitional and habituation variables, may have led to a significant finding. Another area which may warrant further study is the influence of the individual's personal perspective on his or her level of independence following discharge.

The individual's perspective

The differences found between pre and post discharge ADL independence in this study may reflect the effect that each patient's personal perspective on his or her abilities has on his or her post discharge performance, rather than the presence or absence of a particular characteristic. This approach was suggested earlier when it was forwarded that the

finding of less independent post discharge performance among many patients may reflect the difference between what the subjects, in the opinion of the raters, are capable of doing safely, and what the subjects themselves actually feel they can safely carry out on a daily basis. As the perceived danger of the task increases, the number of individuals who will continue to carry it out independently decreases. Utilization of the patient's perspective in program planning is consistent with occupational therapy principles.

Intervention guidelines adopted by the Canadian Association of Occupational Therapy (Department of National Health and Welfare and Canadian Association of Occupational Therapy, 1986) describe occupational therapy as a client-centered process which is "adapted to the needs of the individual and the demands of the environment with which he chooses to comply" (DNHW and CAOT, 1986, p. 2). Recent work on universal outcome measures for occupational therapy practice following these guidelines (Law et al., 1990) appears to hold that the patient's values and perceptions of his or her own ability within his or her own environment form the most significant outcome measures of performance in self-care, work and leisure. In contrast then to outcome measurement using rigid criteria (for example, as seen in self-care assessments such as the BI), the assessment is individualized to reflect the

patient's needs, values and beliefs about activity. The main thrust of this new approach is to make the assessment truly client-centered. However, it also illustrates a new emphasis on the patient's subjective experience of activity.

These Canadian guidelines were based upon the model of occupational performance. Attention to the individual's subjective experience of activity is also consistent with the model of human occupation. Experiences are processed during throughput at the level of the volitional subsystem. The meaning that the individual attaches to the experiences influences future action (Kielhofner and Burke, 1985).

Implications for future research and practice

The results of this study and previous similar studies have important implications for occupational therapy practice and future research. They suggest that while the agreement between pre discharge ADL assessments and post discharge ADL independence in hip fractured patients is statistically significant, this agreement is not strong. Therefore, predischarge ADL assessments alone may often not be accurate predictors of post discharge ADL independence. Therefore, these assessments should be used with caution when making recommendations regarding home help and other post discharge requirements.

To date, researchers have been unable to identify

accurate predictors of less independent post discharge ADL performance. In other words, clinicians have no reliable method with which to anticipate which patients will require more assistance at home than they did in hospital. Given this finding, and the current mandate of provincial health ministries to provide supportive health services to older individuals at home (Mickleburgh, 1990), it may be time for occupational therapists to acknowledge the limitations of in-hospital predischarge assessments and strongly advocate for increased home follow-up and community intervention.

A number of questions arise from this study. The first concerns what measures a hospital-based therapist might take to ensure that discharge planning recommendations are appropriate. At this time the vast majority of Canadian occupational therapists continue to work in institutions (Health and Welfare Canada and Canadian Association of Occupational Therapists Task Force, 1987). Until more occupational therapy services become community-based, patients' predictions of how they will function at home and/or patients' opinions regarding their present function should be closely examined. These may prove more predictive of actual post discharge independence than predischarge performance-based measures.

The second question arising from this study concerns the concordance between occupational therapy predischarge

assessments of instrumental activities of daily living and post discharge function. Evidence suggests that post discharge independence in these activities is even more difficult to predict than post discharge independence in self-care (Kaufert et al., 1979). Since these activities support community living, it is important to determine the extent to which predischarge independence in these activities predicts post discharge independence.

The third question arising from this study concerns the relationship between sex and less independent post discharge performance. Post hoc analyses demonstrated that women may be a greater risk for this outcome than men. If this is true, women may be in more need of follow-up services. This is an important question for further studies to address.

The fourth question arising from this study addresses those individuals who performed more independently post discharge than they had during predischarge ADL assessments. Almost twenty-eight per cent of the subjects in this study demonstrated more independent ADL performance by 5 or more points on the BI, while 14.8% demonstrated more independent ADL performance by 10 or more points (Table 12). One might then ask if there are a proportion of older patients who generally demonstrate more independent function at home post discharge than they did during

predischarge ADL assessments. Success of innovative programs in which quite dependent older individuals were discharged with home support and rehabilitation (Mickleburgh, 1990) suggests that the potential of many patients may not be evident in hospital. If so, it would be important to examine whether, for some patients, institutional placement could be averted by a trial period at home.

Table 12

Distribution of ADL change by age and sex

	ADL change							
	Increase		No change		Decrease		Totals	
Males	n	%	n	%	n	%	n	%
65-74	1	(16.7)	2	(33.3)	3	(50.0)	6	(100)
75+	3	(42.9)	4	(57.1)	0	(0)	7	(100)
Females								
65-74	5	(29.4)	4	(23.5)	8	(47.1)	17	(100)
75+	10	(32.3)	3	(9.7)	18	(58.1)	31	(100)

Conclusion

Sixty-one hip fractured patients were assessed for independence in ADL just prior to and 3 weeks following discharge. There was weak but statistically significant concordance between the two assessments ($K_W = .221$; $p < .05$). Almost 51% of the subjects demonstrated less independent ADL performance at home post discharge. Neither depression, role loss, health status, mental status or social support were significantly associated with less independent post discharge ADL performance. The small size of the sample must be considered when interpreting these results.

The findings of this study are consistent with those of previous studies which examined ADL independence prior to and within one month of hospital discharge. It appears that a significant number of patients are less independent in ADL at home than on predischarge ADL assessments. For this reason, community follow-up is recommended for patients who demonstrate potential problems with self-care.

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APPENDIX I

Power test (after Cohen and Cohen, 1983)

H_O: $R^2 < .2$

H_A: $R^2 \geq .2$

At an alpha level of .05 and a study power of .80, given 6 independent variables, L = 13.62.

$$f^2 = \frac{R^2}{1 - R^2}$$

$$= \frac{.8}{.2}$$

$$= .25$$

Where k equals the number of independent variables and n* is the number of subjects required:

$$n^* = \frac{L}{f^2} + k + 1$$

$$= \frac{13.62}{.25} + 6+1$$

$$= 61.48$$

Therefore, in order to find .2 variance at an alpha level of .05 with a study power of .80, approximately 62 subjects are needed.

APPENDIX II

Consent form

Title: Occupational therapy predischarge ADL assessments: How well do they predict function at home?

Investigator: Mary Reilly, BSc (OT)
Department of Occupational Therapy
308 Corbett Hall
University of Alberta
Edmonton, Alberta]
T6G 2G3
270 - 1108

Purpose: The purpose of this study is to investigate a number of risk factors for decline in functional abilities after discharge from hospital.

Consent: I, _____, agree to participate in the study mentioned above. I understand that I will be given brief tests which will measure my mental abilities, mood, social supports, general health and regular activities. Altogether these will take approximately one hour. My ability to dress, bathe, walk and transfer will be assessed before I am discharged. Three weeks following discharge I will be telephoned by the researcher who will ask me how I am doing in these areas.

I understand that my participation in this study is completely voluntary and that I may withdraw from the study at any time. Withdrawing from the study will not affect my subsequent treatment in any way. I also understand that all of the information collected by the investigator will be kept strictly confidential. I may contact the investigator at the Calgary telephone number given above should I have any questions.

Signature: _____ Date _____

Investigator: _____ Date _____

Witness: _____ Date _____

APPENDIX III
BARTHEL INDEX

Instructions for scoring the Barthel Index

Note: A score of zero is given when the patient cannot meet the defined criterion.

1. Feeding
   - 10 = Independent. The patient can feed himself a meal from a tray or table when someone puts the food within his reach. He must put on an assistive device if this is needed, cut up the food, use salt and pepper, spread butter etc. He must accomplish this in a reasonable time.
   - 5. = Some help is necessary (when cutting up food, etc., as listed above).

2. Moving from wheelchair to bed and return
   - 15. = Independent in all phases of this activity. Patient can safely approach the bed in his wheelchair, lock brakes, lift footrests, move safely to bed, lie down, come to a sitting position on the side of the bed, change position of wheelchair, if necessary, to transfer back into it safely, and return to the wheelchair.
   - 10 = Either some minimal help is needed in some step of this activity or the patient needs to be reminded or supervised for safety of one or more parts of this activity.
   - 5 = Patient can come to a sitting position without the help of a second person but needs to be lifted out of bed, or if he transfers with a great deal of help.

3. Doing personal toilet
   - 5 = Patient can wash hands and face, comb hair, clean teeth, and shave. He may use any kind of razor but must put in blade or plug in razor without help as well as get it from drawer or cabinet. Female patients must put on own make-up, if used, but need not braid or style hair.

4. Getting on and off toilet
   - 10 = Patient is able to get on and off toilet, fasten and unfasten clothes, prevent soiling of clothes, and use toilet paper without help. He may use wall bar or other stable object of support if needed. If it is necessary to use a bed pan instead of a toilet, he must be able to place it on a chair, empty it and clean it.
   - 5 = Patient needs help because of imbalance or in handling clothes or in using toilet paper.

5. Bathing self
   - 5 = Patient may use tub, shower, or take a complete sponge bath. He must be able to do all the steps involved in whichever method is

employed without another person being present.

6. Walking on a level surface
   15 = Patient can walk at least 50 yards without help or supervision. He may wear braces or prostheses and use crutches, canes or a walkerette but not a rolling walker. He must be able to lock and unlock braces if used, assume the standing position and sit down, get the necessary mechanical aides into position for use, and dispose of them when he sits. (Putting on and taking off braces is scored under dressing).
   10 = Patient needs help or supervision in any of the above but can walk at least 50 yards with a little help.

6a. Propelling a wheelchair
   5 = If a patient cannot ambulate but can propel a wheelchair independently. He must be able to go around corners, turn around, maneuver the chair to a table, bed, toilet, etc.. He must be able to push a chair at least 50 yards. Do not score this item if the patient gets a score for walking.

7.. Ascending and descending stairs
   10 = Patient is able to go up and down a flight of stairs safely without help or supervision. He may and should use handrails, canes or crutches when needed. He must be able to carry crutches as he ascends or descends stairs.
   5 = Patient needs help with or supervision of any one of the above items.

8. Dressing and undressing
   10 = Patient is able to put on and remove and fasten all clothing, and tie shoe laces (unless it is necessary to use adaptations for this). This activity includes putting on and removing and fastening corset or braces when these are prescribed. Such special clothing ass suspenders, loafer shoes, dresses that open down the front may be used when necessary.
   5 = Patient needs help in putting on and removing or fastening any clothing. He must do at least half of the work himself. He must accomplish this in a reasonable time.
   Women need not be scored on the use of a brassiere or girdle unless these are prescribed garments.

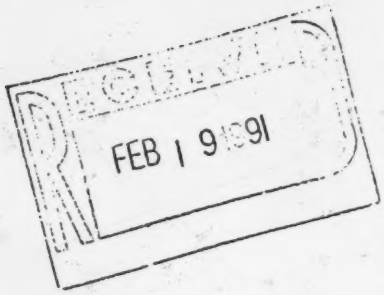
9. Continence of bowels
   10 = Patient is able to control his bowels and have no accidents. He can use a suppository or take an enema when necessary (as for spinal cord injury patients who had had bowel training).
   5 = Patient needs help in using a suppository or taking an enema or has occasional accidents.

10. Continence of bladder

10 = Patient is able to control his bladder day and night. Spinal cord injury patients who wear an external device and leg bag must put them on independently, clean and empty bag, and stay dry day and night.

5 = Patient has occasional accidents or cannot wait for the bed pan or get to the toilet in time or needs help with an external device.

Reproduced from Mahoney, F.I., & Barthel, D.W. (1965). Functional evaluation: The Barthel Index. Maryland State Medical Journal,14,62-65. With permission.



APPENDIX IV

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Editor
Maryland Medical Journal
1211 Cathedral St
Baltimore, Maryland
21201
USA

Dear Sir or Madam,

I am a graduate student in occupational therapy at the University of Alberta. In my thesis research project I measured ADL performance in hip fractured individuals using the Barthel Index. This measurement tool was published in your journal in 1965 in the article: Mahoney, F.I., & Barthel, D.W. (1965). Functional evaluation: The Barthel Index. Maryland State Medical Journal, 14, 62-65.

I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

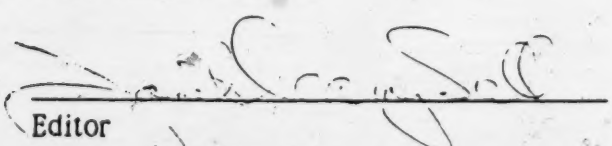
I would very much appreciate it if you would sign below to indicate your permission for me to reprint the Barthel Index for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to reprint the Barthel Index and include it in her master's thesis in Occupational Therapy at the University of Alberta.



Editor
Maryland Medical Journal
(formerly Maryland State Medical Journal)

2/19/90
Date

Managing Editor

APPENDIX V

ROLE CHECKLIST

NAME _____ AGE _____ DATE _____

SEX: ☐ MALE ☐ FEMALE ARE YOU RETIRED: ☐ YES ☐ NO

MARITAL STATUS: ☐ SINGLE ☐ MARRIED ☐ SEPARATED ☐ DIVORCED ☐ WIDOWED

The purpose of this checklist is to identify the major roles in your life. The checklist, which is divided into two parts, presents 10 roles and defines each one.

PART I

Beside each role, indicate, by checking the appropriate column, if you performed the role in the past, if you presently perform the role, and if you plan to perform the role in the future. You may check more than one column for each role. For example, if you volunteered in the past, do not volunteer at present, but plan to in the future, you would check the past and future columns.

ROLE	PAST	PRESENT	FUTURE
STUDENT: Attending school on a part-time or full-time basis.			
WORKER: Part-time or full-time paid employment.			
VOLUNTEER: Donating services, ***at least once a week,*** to a hospital, school, community, political campaign, and so forth.			
CARE GIVER: Responsibility, ***at least once a week,*** for the care of someone such as a child, spouse, relative, or friend.			
HOME MAINTAINER: Responsibility, ***at least once a week,*** for the upkeep of the home such as housecleaning or yardwork.			
FRIEND: Spending time or doing something, ***at least once a week,*** with a friend.			
FAMILY MEMBER: Spending time or doing something, ***at least once a week,*** with a family member such as a child, spouse, parent, or other relative.			
RELIGIOUS PARTICIPANT: Involvement, ***at least once a week,*** in groups or activities affiliated with one's religion (excluding worship).			
HOBBYIST/AMATEUR: Involvement, ***at least once a week,*** in a hobby or amateur activity such as sewing, playing a musical instrument, woodworking, sports, the theater, or participation in a club or team.			
PARTICIPANT IN ORGANIZATIONS: Involvement, ***at least once a week,*** in organizations such as the American Legion, National Organization for Women, Parents Without Partners, Weight Watchers, and so forth.			
OTHER: _____ A role not listed which you have performed, are presently performing, and/or plan to perform. Write the role on the line above and check the appropriate column(s).			

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APPENDIX VI

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Frances Oakley
Co-ordinator, Clinical Research
Occupational Therapy Service
National Institute of Health
Bethesda, Maryland
20892
USA

Dear Ms Oakley,

I wrote to you in July 1989 stating my intention to use the Role Checklist in my master's thesis research project. I requested a copy of this assessment from you and you sent it to me. I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the Role Checklist for this purpose. Thank you.

Sincerely,

Mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy the Role Checklist and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Frances Oakley
Francis Oakley, M.S.

February 28, 1991
Date

2.

APPENDIX VII

GERIATRIC DEPRESSION SCALE

Choose the best answer for how you felt the past week.

1.	Are you basically satisfied with your life?	YES	NO
2.	Have you dropped many of your activities and interests?	YES	NO
3	Do you feel that your life is empty?	YES	NO
4	Do you often get bored?	YES	NO
5.	Are you hopeful about the future?	YES	NO
6.	Are you bothered by thoughts you can't get out of your head?	YES	NO
7.	Are you in good spirits most of the time?	YES	NO
8.	Are you afraid that something bad is going to happen to you?	YES	NO
9.	Do you feel happy most of the time?	YES	NO
10.	Do you often feel helpless?	YES	NO
11.	Do you often get restless and fidgety?	YES	NO
12.	Do you prefer to stay at home, rather than going out and doing new things?	YES	NO
13.	Do you frequently worry about the future?	YES	NO
14.	Do you feel you have more problems with memory than most?	YES	NO
15.	Do you think it is wonderful to be alive now?	YES	NO
16.	Do you often feel downhearted and blue?	YES	NO
17.	Do you feel pretty worthless the way you are now?	YES	NO
18.	Do you worry a lot about the past?	YES	NO
19.	Do you find life very exciting?	YES	NO
20.	Is it hard for you to get started on new projects?	YES	NO
21.	Do you feel full of energy?	YES	NO
22.	Do you feel that your situation is hopelesss?	YES	NO
23.	Do you think that most people are better off than you are?	YES	NO
24.	Do you frequently get upset over little things?	YES	NO
25.	Do you frequently feel like crying?	YES	NO
26.	Do you have trouble concentrating?	YES	NO
27.	Do you enjoy getting up in the morning?	YES	NO
28.	Do you prefer to avoid social gatherings?	YES	NO
29.	Is it easy for you to make decisions?	YES	NO
30.	Is your mind as clear as it used to be?	YES	NO

J. Yesavage, MD Reprinted with permission of author.

APPENDIX VIII

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Dr Jerome Yesavage
Associate Professor
Stanford University Medical School
Stanford University
Stanford, CA
94305
USA

Dear Dr Yesavage,

I am a graduate student in occupational therapy at the University of Alberta. In my thesis research project I compared pre and post discharge ADL performance of hip fractured individuals. I measured depression using your Geriatric Depression Scale.

I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the Geriatric Depression Scale for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy the Geriatric Depression Scale and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Jerome Yesavage, M.D. — Date: 2/15/91

APPENDIX IX

SHORT PORTABLE MENTAL STATUS QUESTIONNAIRE

Instructions: Ask questions 1-10 in this list and record all answers. Ask question 4a only if patient does not have a telephone. Record total number of errors based on ten questions.
Allow one more if subject has only a grade school education.
Allow one less if subject has education beyond high school.
Allow one more error for black subjects, using identical education criteria.

+	-	
		1. What is the date today_____(day/month/year)
		2. What day of the week is it? _____
		3. What is the name of this place? _____
		4. What is your telephone number? _____
		4a What is your street address?_____ (Ask only if patient does not have a telephone)
		5. How old are you? _____
		6. When were you born? _____
		7. Who is the President of the U.S. now? _____
		8. Who was President just before him? _____
		9. What was your mother's maiden name? _____
		10. Subtract 3 from 20 and keep subtracting from each new number all the way down.

_____TOTAL NUMBER OF ERRORS

0-2 Errors	Intact Intellectual Functioning
3-4 Errors	Mild Intellectual Impairment
5-7 Errors	Moderate Intellectual Impairment
8-10 Errors	Severe Intellectual Impairment

To be completed by interviewer

Patient's name: _____ Date: _____

Sex: 1. Male
2. Female

Race: 1. White
2. Black
3. Other

Years of education

1. Grade School
2. High School
3. Beyond High School

Interviewer's Name: _____

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APPENDIX X

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Dr Eric Pfeiffer
University of Southern Florida
12901 N 30th St
Tampa, Florida
33612
USA

Dear Dr Pfeiffer,

I am a graduate student in occupational therapy at the University of Alberta. In my thesis research project I compared pre and post discharge ADL performance of hip fractured individuals. I measured mental status using your Short Portable Mental Status Questionnaire.

I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the Short Portable Mental Status Questionnaire for this purpose. Thank you.

Sincerely,

Mary Reilly

I give my permission to Mary Reilly to copy the Short Portable Mental Status Questionnaire and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Eric Pfeiffer, M.D. — Date 2/20/91

APPENDIX XI

GENERAL HEALTH STATUS

"FOR YOUR AGE WOULD YOU SAY, IN GENERAL, YOUR HEALTH IS:

Excellent
Good
Fair
Poor
Bad

APPENDIX XII

PERSONAL RESOURCE QUESTIONNAIRE - PART 2

Q-11. Below are some statements with which some people agree and others disagree. Please read each statement and circle the response most appropriate for you. There is no right or wrong answer.

7 STRONGLY AGREE
6 AGREE
5 SOMEWHAT AGREE
4 NEUTRAL
3 SOMEWHAT DISAGREE
2 DISAGREE
1 STRONGLY DISAGREE

	STATEMENTS							
a.	There is someone I feel close to who makes me feel secure.	7	6	5	4	3	2	1
b.	I belong to a group in which I feel important.	7	6	5	4	3	2	1
c.	People let me know I do well at my work (job, homemaking).	7	6	5	4	3	2	1
d.	I can't count on my relatives and friends to help me with problems.	7	6	5	4	3	2	1
e.	I have enough contact with the person who makes me feel special.	7	6	5	4	3	2	1
f.	I spend time with others who have the same interests as I do.	7	6	5	4	3	2	1
g.	There is little opportunity in my life to be giving and caring to another person.	7	6	5	4	3	2	1
h.	Others let me know they enjoy working with me (job, committees, projects).	7	6	5	4	3	2	1
i.	There are people who are available if I needed help over an extended period of time.	7	6	5	4	3	2	1
j.	There is no one to talk to about how I am feeling.	7	6	5	4	3	2	1
k.	Among my group of friends we do favours for each other.	7	6	5	4	3	2	1
l.	I have the opportunity to encourage others to develop their interests and skills.	7	6	5	4	3	2	1

m.	My family lets me know that I am important for keeping the family running.	7	6	5	4	3	2	1
n.	I have relatives or friends that will help me out even if I can't pay them back.	7	6	5	4	3	2	1
o.	When I am upset there is someone I can be with who lets me be myself.	7	6	5	4	3	2	1
p.	I feel no one has the same problems as I.	7	6	5	4	3	2	1
q.	I enjoy doing little extra things that make another person's life more pleasant.	7	6	5	4	3	2	1
r.	I know that others appreciate me as a person.	7	6	5	4	3	2	1
s.	There is someone who loves and cares about me.	7	6	5	4	3	2	1
t.	I have people to share social events and fun activities with	7	6	5	4	3	2	1
u.	I am responsible for helping provide for another person's needs.	7	6	5	4	3	2	1
v.	If I need advice there is someone who would assist me to work out a plan for dealing with the situation.	7	6	5	4	3	2	1
w.	I have a sense of being needed by another person.	7	6	5	4	3	2	1
x.	People think I'm not as good a friend as I should be.	7	6	5	4	3	2	1
y.	If I got sick there is someone to give me advice about caring for myself.	7	6	5	4	3	2	1

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APPENDIX XIII

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Dr Patricia Brandt
Associate Professor
Parent-Child Nursing, SC-74
University of Washington,
Seattle, Washington
98195
USA

Dear Dr Brandt,

I wrote to you in July 1989 stating my intention to use Part 2 of the Personal Resource Questionnaire (PRQ) in my master's thesis research project, after I received a copy of this assessment from you. I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the PRQ for this purpose. Thank you.

Sincerely,

mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy Part 2 of the Personal Resource Questionnaire and include it in her master's thesis in Occupational Therapy at the University of Alberta.

Patricia A. Brandt — 2/19/91

Patricia Brandt, PhD — Date

APPENDIX XIV

#410, 540 Cambridge Street S.
Ottawa, Ontario
K1S 5M7
February 5, 1991

Clarann Weinert, S.C.
School of Nursing
Montana State University
Bozeman, Montana
59717
USA

Dear Sr Weinert,

I wrote to Dr Brandt in July 1989 stating my intention to use Part 2 of the Personal Resource Questionnaire (PRQ) in my master's thesis research project, after I received a copy of this assessment from her. I would like to include a copy of the assessment as an appendix to my thesis. A copy of this thesis will be retained by the library of the University of Alberta and will be loaned on request.

I would very much appreciate it if you would sign below to indicate your permission for me to copy the PRQ for this purpose. Thank you.

Sincerely,

Mary Reilly

Mary Reilly

I give my permission to Mary Reilly to copy Part 2 of the Personal Resource Questionnaire and include it in her master's thesis in Occupational Therapy at the University of Alberta.

J. Clarann Weinert — 2/19/91

Clarann Weinert, S.C. — Date